MAY 10, 1954

NEWS ISSUE

Electrical World

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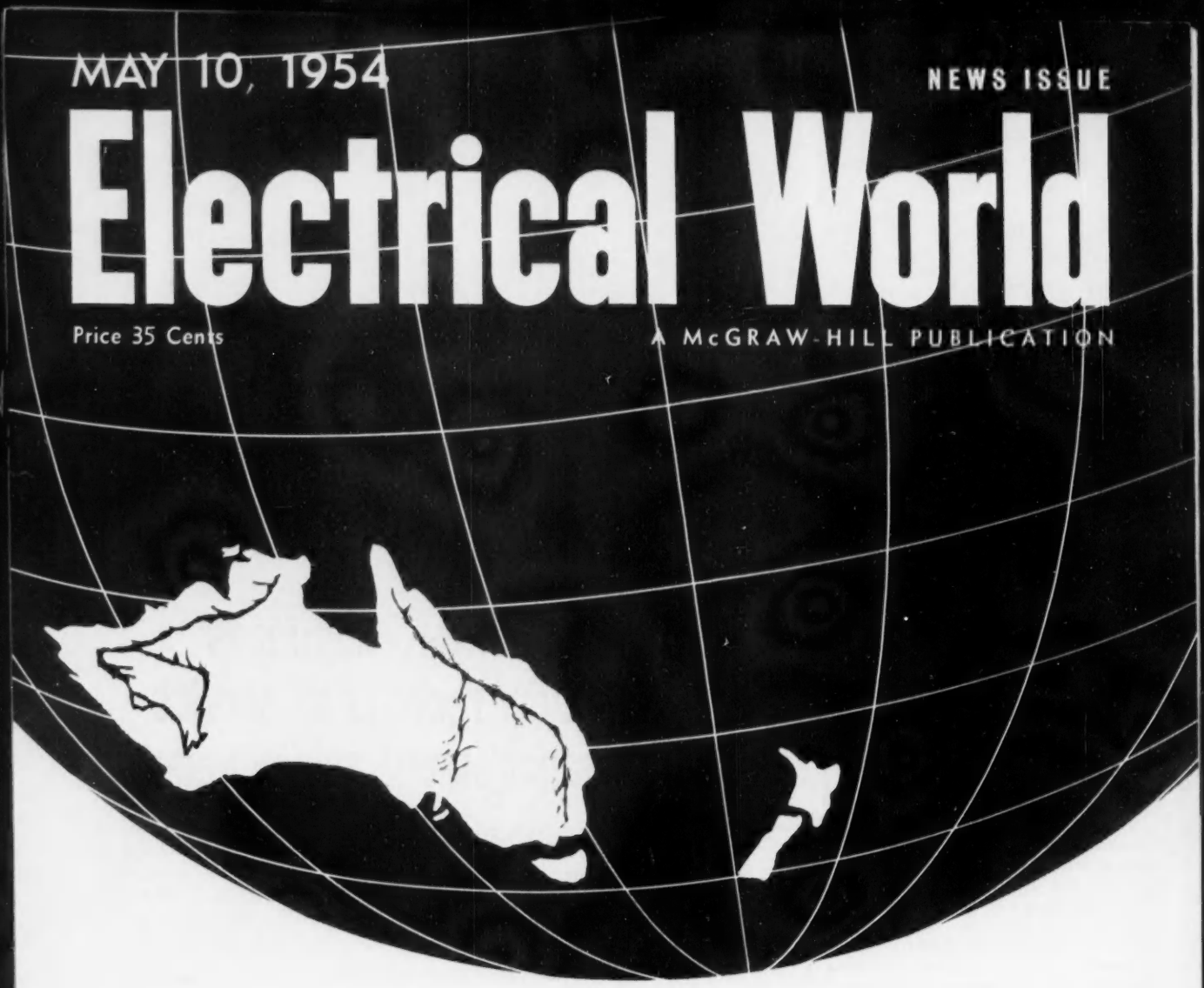


Down Under . . .

Australia's ending her brownout

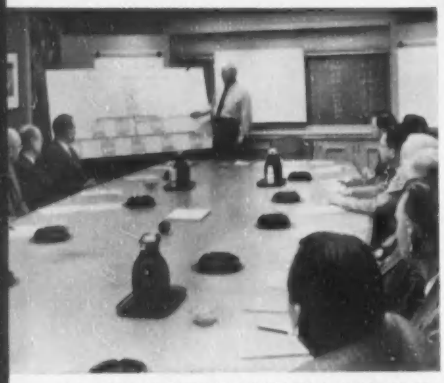
Down Under . . .

New Zealand's testing steam fr

E B POWER GS W 12
UNIVERSITY MICROFILMS IN
313 N 1 ST
ANN ARBOR MICH

MANAGEMENT SELECTION AND TRAINING by WISCONSIN ELECTRIC POWER was designed to meet the increasing need for good management material through special training, careful placement, rotation, and promotion of selected men, thus assuring enlightened and efficient public service through the provision of a constantly high-grade staff of executive personnel.

CITATIONS FOR THE FIVE NOMINEES competing for the 1953 Coffin Award are signed by W. H. Sammis, President of EEI (left), and R. J. Cordiner, President of G.E. The Coffin Award for outstanding operating and community achievement, will be presented on June 3.



OPERATING AND COMMUNITY ACHIEVEMENT by CLEVELAND ELECTRIC ILLUMINATING CO. has resulted from the application of modern and progressive management principles. Regular courses are an integral part of the CEI program. In addition to meeting problems of growing complexity from rapid expansion and increasing costs, as well as effecting reduced operating costs, the company has also broadened executive participation in civic and community activities.

Coffin Award nominees score new records of service and management achievement

Five electric ulilities have been nominated to compete for this year's Charles A. Coffin Award—the industry's highest honor—on the basis of significant achievements during 1953. Each company has received a citation from Edison Electric Institute. General Electric, as donor of the Coffin Award, salutes their outstanding efforts—a lasting tribute to the entire industry. General Electric Co., Schenectady 5, N. Y. 301-263

MORE POWER TO AMERICA

GENERAL ELECTRIC

PIONEER ENGINEERING of AMERICAN GAS & ELECTRIC has helped electric utilities maintain low prices for electricity while constantly improving service. Dynamic engineering policy, discussed in such meetings as above, pioneered in 1953 first 330,000-volt transmission line in the U.S. and plans for the first generating equipment utilizing steam above its critical pressure.

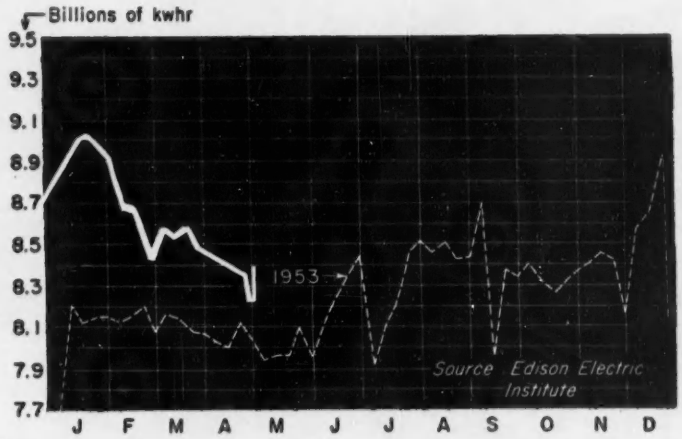
WATER RESOURCE DEVELOPMENT reported to community leaders by TEXAS ELECTRIC SERVICE in conjunction with its own power development program is evidence of farsighted, aggressive civic leadership. A serious and challenging emergency was met, and adequate water resources have been assured for continuing growth of population, business and industry in the utility's service area.

OVER-ALL REGIONAL DEVELOPMENT was recognized as a basic public service concept by CONNECTICUT LIGHT & POWER. Their active participation in the Connecticut Development Credit Corp., whose board of directors is shown, and the Connecticut Valley Program has marshalled the co-operative resources of private enterprise for supplying capital from new sources to new and expanding industry.

VOLUME 141, NO. 19

May 10, 1954

Electrical World



Output Week Ended May 1—8,390,000,000 Kwhr

Seasonally Adjusted Index†—166.7

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South-Cent.	Rocky Mount.	Pacific NW	Pacific SW
May 1	+5.7	+0.2	+0.5	−4.0	+7.2	+19.6	+14.1	+7.6	+9.3	+6.4
Apr. 24	+3.0	−0.7	−2.1	−5.3	+6.7	+14.1	+8.9	+7.4	+6.9	+4.0
Apr. 17	+2.9	−1.1	−1.4	−5.7	+6.1	+16.2	+12.9	+4.9	+3.9	−1.6

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load (Million Kw)	Feb.	78.0	81.1	73.7
Capacity (Million Kw)	Feb.	92.46	91.68	82.83
Production (Billion Kwhr)	Feb.	35.21	39.42	33.60
Hydro	Feb.	8.56	8.90	8.99
Fuel	Feb.	26.65	30.52	24.60
Fuel Consumption				
Coal (Million Tons)	Feb.	9.07	10.92	9.16
Oil (Million Barrels)	Feb.	5.70	8.29	6.81
Gas (Billion Cu Ft)	Feb.	75.74	67.41	57.82
Sales (Billion Kwhr)	Feb.	32.37	33.45	31.21
Residential	Feb.	10.50	10.96	9.31
Commercial	Feb.	5.60	5.79	5.17
Industrial	Feb.	14.21	14.52	14.76
Other	Feb.	2.05	2.17	1.96
Net Income Class A & B Companies ($ Million)	Dec.	105.32	84.26	101.50
Estimated Dec. '54 Peak (Million Kw)	Feb.	92.5	93.4	96.0
Kwhr per Residential Customer (12 Month Average)	Jan.	2,363	2,345	2,183
Revenue per Kwhr Residential Service (12 Month Average)	Jan.	2.74¢	2.74¢	2.77¢
Canadian Production (Billion Kwhr)	Feb.	5.15	5.63	5.26

Business Statistics

FRB Industrial Production Index†	Mar.	125*	126	138
Gross National Production Annual Rate ($ Billion)	1stQtr	358.5	363.5	363.9
EW 4 Industry Production Index†	Mar.	113.1	115.0	127.0
ENR Construction Cost Index††	Apr.	129.0	128.7	123.6
BLS Consumer's Price Index	Feb.	115.0	115.2	113.4
NEMA Insulation Materials Sales Index†	Feb.	120	124	177
NEMA Electric Appliance Sales Index†	Feb.	98	90	121
NEMA Household Refrig. Sales Index†	Feb.	91	95	106

*Preliminary **Revised †1947-49=100 ††1949=100

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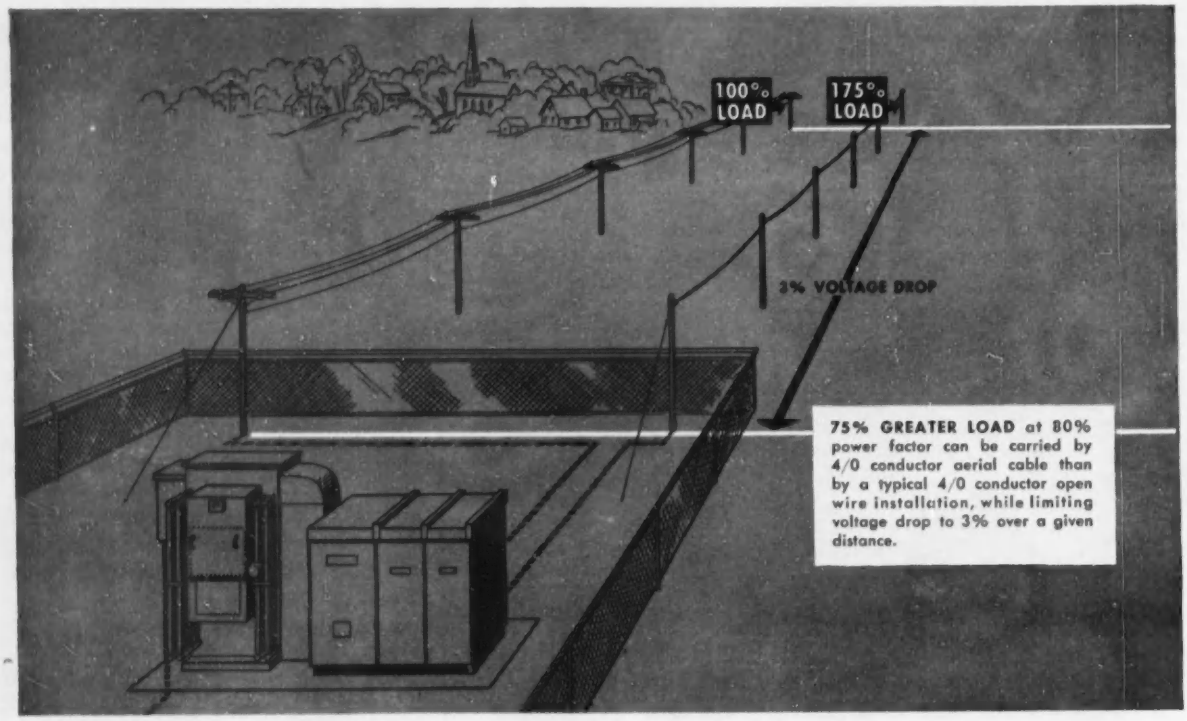
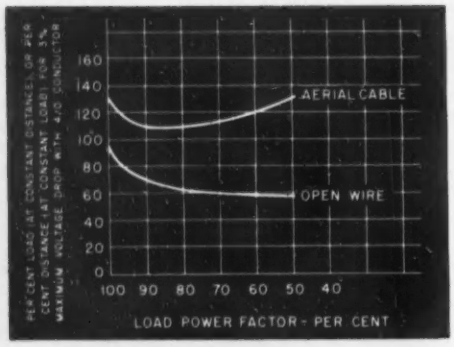
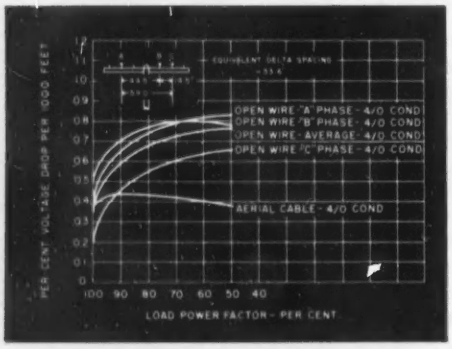

100% LOAD
175% LOAD
3% VOLTAGE DROP
75% GREATER LOAD at 80% power factor can be carried by 4/0 conductor aerial cable than by a typical 4/0 conductor open wire installation, while limiting voltage drop to 3% over a given distance.

WHERE VOLTAGE DROP SETS CIRCUIT LOAD LIMITS...



Comparison of load-carrying ability over a constant distance at 4.16 kv, 4/0 aerial cable vs. 4/0 open wire.


PER CENT VOLTAGE DROP PER 1000 FEET
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OPEN WIRE "A" PHASE - 4/0 COND
OPEN WIRE "B" PHASE - 4/0 COND
OPEN WIRE - AVERAGE - 4/0 COND
OPEN WIRE "C" PHASE - 4/0 COND
AERIAL CABLE - 4/0 COND
100 90 80 70 60 50 40
LOAD POWER FACTOR - PER CENT

Voltage regulation per 1000 feet
4.16 kv feeders, 1000 kva base, 3-phase

G-E preassembled aerial cable carries more load

General Electric preassembled aerial cable can help you meet the problem of load limitation due to voltage drop in distribution lines. Because of its lower reactance, this cable can carry far more load within a permissible voltage drop than can an open wire line of the same conductor size. (See graphs at left.)

As loads increase, this characteristic permits you to operate G-E Super Coronol* preassembled aerial cable at its full rated copper temperature. And, of course, this cable always gives you the benefits of its trim appearance and long life, reduction in tree trimming costs, safety, and service continuity in case of storms.

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GENERAL ELECTRIC

THE ELECTRICAL WEEK

The Issue's News Highlights . . . Atomic Energy will be no panacea for future power shortages, but countries abroad are likely to turn to nuclear generation for help, a report to Congress indicates.

Pacific Gas & Electric Co is ready to buy in the power facilities of California's Central Valley Project, a spokesman tells Hoover Commission task force.

A second private group has offered to build a plant to supply AEC's Paducah, Ky., installation.

Increasingly heavy attacks against public power was major concern dominating early session of the American Public Power Association at annual meeting held last week in Chicago.

Addressing public power delegates, Sen Warren G. Magnuson (D-Wash.) declared "The private power interests of this country have declared war on you." He asserted that allied with private utilities in the antipublic power movement are Interior Secretary Douglas McKay and Undersecretary Ralph Tudor. "And," he added, "on occasion, these two are joined by their chief, the President of the United States, in backing up policies detrimental to public power."

At a later session Tudor reiterated Interior's position in the power squabble.

Retiring APPA Pres Carroll A. Oliver noted that in the past year "at both the national and local levels we have come under the heaviest attack in our history—from the freest spending and the biggest lobbying organization in the country."

Michigan Governor Williams' Fact-Finding Committee recommended in the Consumers Power—UWUA-CIO wage dispute that (1) raises of 6¢, 7¢ and 8¢ an hour, spread through various classifications, be granted; (2) grant an additional holiday—Washington's Birthday—bringing the total to seven, plus Presidential Election Day which comes every four years; (3) adopt four-week vacation after 25 years of service vs three weeks granted previously; and (4) expansion of group hospitalization insurance to provide for 120-day coverage and full payment for semi-private room for Consumers employees only.

As EW went to press Detroit Edison Co was the only electric utility which had directly indicated it would appear at Congressional hearings on amending the 1946 AEC Act . . . Dr Robert P. Petersen, AEC nuclear physicist, will join Republic Steel on July 1 to study and develop use of nuclear materials in the operation of steel plants.

Chelan County, Wash., PUD won Superior Court approval to continue its condemnation suit against Washington Water Power facilities in Chelan County.

Off the Washington Wire . . . Interior Secretary Douglas McKay is primed for an all-out political speech in Portland, Ore., tonight (May 10) defending GOP power policies. Oregon primaries are to be held May 23.

City of Tacoma is planning a large diversion project to tunnel flow of the south fork of the Skakomish River through the existing turbines of the Cushman Project on the north fork of the river.

New FPC rules reduce annual charges against publicly owned licensed hydro projects by 30%. Law providing for this change was passed last year.

Bureau of Reclamation is trimming summer pumping rates for nonfederal Reclamation customers in the Eastern Division of the new Missouri River Basin Project.

Bills are introduced in Senate and House to suspend the 1945 Congressional authorization for federal development and permit Alabama Power Co to ask FPC approval to build $100 million five-dam project on the Coosa River in Alabama and Georgia.

Boston Edison's plan for bi-monthly meter readings, previously approved by the state commission, has been attacked in a petition scheduled to be heard by that board on May 12.

A six-member steering committee of the Rural Electric Power-Use Conference, sponsored by REA, will meet in Chicago on May 26 to help charter a future program. The group is made up of rural co-ops, electrical equipment manufacturers, electric companies, and co-op organizations.

Worthington Corp acquired Mullenbach Electrical Manufacturing Co, Los Angeles, through its wholly owned subsidiary, Electric Machinery Manufacturing Co.

Executive Changes—Walker L. Cisler, president of Detroit Edison, is slated to become chief executive July 1 when office of board chairman is consolidated with the presidency. At that time Prentiss M. Brown will retire as board chairman, and Vice Pres Charles R. Landrigan becomes executive vice president to succeed retiring Arthur S. Albright . . . Cleveland Electric Illuminating Co's General Counsel Lee C. Howley was elected vice president and general counsel . . . Richard W. Leach, Western Division manager for Wisconsin Electric Power, was named a vice president to replace Stanley B. Sherman, retired . . . Westinghouse Electric Corp's three new vice presidents are Walter J. Maytham, Dale McFeatters, and Otis O. Rae . . . Arthur T. Hunter and Fred O. Pahmeyer were appointed vice presidents of Combustion Engineering, Inc.

Congress Looks at Atomics Abroad

Atomic energy has been peddled as a cure-all for the world's economic ills—a brand new source of cheap energy which will turn deserts into rose gardens and make underdeveloped areas hum with modern industry.

A more down-to-earth evaluation of its potentialities was on its way to Congress this week as hearings began on legislation to share some of our atomic knowledge with friendly countries.

Prepared at the direction of the Atomic Energy Commission, the government report says flatly that nuclear power plants will not usher in a new era of plenty and rapid economic growth in the nations of the free world. Rather, it takes the view that here is a promising new energy source that must take its place in competition with existing sources.

In attempting to gauge the atomic power potential in foreign countries, the report is limited to a 20-year outlook, with case studies in five industrial nations. It assumes that nuclear power plants will be available early in the period 1960-1975 in a reasonably flexible array of sizes. Investment costs will run around $75 per kilowatt above costs of conventional steam or internal combustion plants. These nuclear plants will be capable of producing power at costs ranging from 7 to 8 mills if allowed to operate 80% of the time.

Here are highlights of the report:

- Nuclear power plants will be competitive with conventional plants using high-cost coal or oil.
- They can't compete with existing hydroelectric generation or with future hydropower developed at favorable sites.
- Even where nuclear plants produce cheaper energy, they won't be a major stimulus to economic growth since power costs are only a small part of the operating costs of most industries.
- Highly industrialized countries with dwindling low-cost energy sources are most likely spots for nuclear power development. Great Britain and Japan are good examples.
- Except in special cases, nuclear power is likely to be less economical than conventional power sources in the less developed areas.
- Some countries will go ahead with nuclear power projects, even though uneconomic, for reasons of national prestige, or to conserve scarce foreign exchange.

The only cost advantage which atomic plants offer over conventional power plants is in the fuel. The mechanism required to house the atomic firebox will be more expensive than that required by conventional coal or oil plants. The turbines, generators, switchyards and transmission facilities will be about the same as required by conventional electric power generation.

Since the fuel cost of operating a modern electric generating plant runs only about one-third of the total production costs, the area of savings is limited. Experts figure the cost of nuclear fuel will be just a shade below 3 mills per kwhr.

All but about 16% of the modern steam plants in the U. S. are now beating the 7-to-8 mill cost of production which the experts assume for nuclear power during the next decade or two.

Thing to remember is that the U. S. is one of the favored nations in the generation of electricity. Besides sizable hydroelectric resources, this country also has plentiful supplies of coal and oil. It's a different story in foreign countries, as the report indicates:

Great Britain

Continually rising costs of coal in Britain will likely fender nuclear-generated power competitive with conventional sources by 1960. During the next 15 years, the new source of power could economically spread throughout most of the country.

Current costs of generating electric power at steam plants in Britain average 8.2 mills per kwhr. However, there is a wide variance in production costs in the country due to differences in delivery costs of fuel and plant efficiency.

How Others Are Developing Nuclear Power

Country	Nuclear Fuel Supply	Basic Research	Reactor Construction	Future Plans
Belgium	Controls a major uranium source	Has some access to British research		One research and one power reactor
France	Adequate supplies available	Substantial	Two heavy water research reactors already built	Two Fuel-production reactors for power program
Western Germany	Small uranium deposits believed available	Some theoretical experiments	Banned since end of World War II	Small research reactors will be permitted
Italy	Not known	Small amount		Experimental reactor planned; lack of capital hampers program
Netherlands and Norway	Not known	Considerable	Heavy water reactor in operation	Norwegians interested in ship-propulsion, Dutch in electric power
Sweden	Low-grade uranium reserves available	Advanced	Research type near operating date	Sizeable power reactor planned; large program being set up
Switzerland	Little or none available	Site of European organization research center		Research reactor planned
United Kingdom	Access to plentiful uranium sources	Probably on par or ahead of U.S.	Two research, two production, one low-power breeder built. Full scale breeder and another power reactor under construction	Ambitious power reactor program on planning boards
Canada	A major source of uranium supply	Considerable program carried on with U.S. in war years	Two heavy water research reactors in operation a third planned	Long-range plans for power reactor
Brazil	Substantial deposits of potential thorium ore	Small amount	Research toward experimental	Power reactor planned
Australia	Large deposits uranium discovered	Just beginning		First power reactor scheduled for completion in 1957
India	Has domestic sources of uranium and deposits of potential thorium ore	Broad and advanced program		Research reactor planned
Japan	Not known	Just getting under way		

These differences may be offset somewhat by locating more plants at pitheads and the integration of power into the super grid now under construction. But even with these advantages, the rising cost of coal will boost power costs to around 11 mills per kwhr during the next 20 years.

Japan

Japan represents another industrial nation with dwindling conventional fuel resources. It has tapped most of its favorable hydropower sites, which now furnish about 80% of the nation's electric power requirements. Domestic coal, for the most part low-grade and high-cost, furnishes most of the remaining 20%.

Best figures available indicate the power produced at Japanese steam plants runs around 20 mills per kwhr.

Thus nuclear power will be able to compete with some 20% of Japan's power generation whenever the new power source can be efficiently developed at something below a 20 mill figure.

Atomic power development was banned in Japan during American occupation which lasted from 1946 to 1951. The peace treaty signed in 1951 removed the ban.

Brazil

Bulk of Brazil's electric power requirements for the next 20 years can be more economically met from hydropower than from nuclear power. The hydro potential is the largest in South America and ranks very high in the world. Costs of hydro production is considerably below the 7-to-8 mill per kwhr costs assumed for nuclear power.

There may be room for some nuclear power development to replace thermal plants. However, this would come mainly in remote areas where inland resources are being developed.

The Rhodesias

Although Northern and Southern Rhodesia have huge potential deposits of nuclear fuel ores, there is little reason to believe the area will turn to nuclear power to solve its present energy shortages.

Reasons are that it still has ample resources of hydropower and coal, both of which can beat the assumed costs of nuclear power.

Pacific G&E Makes CVP Offer

Company spokesman tells Hoover Commission task force it is willing to buy power facilities of the project

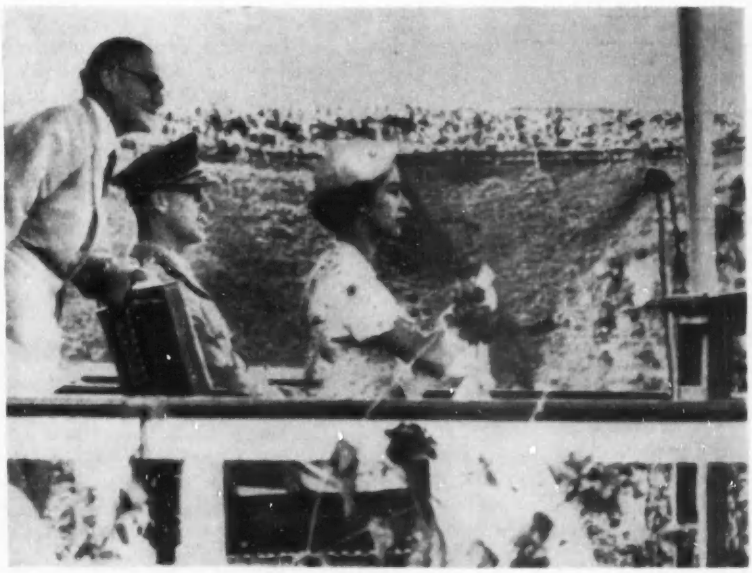
If Congress desires, Pacific Gas & Electric Co, according to its statement last week before a Hoover Commission task force in San Francisco, is willing to buy the power transmission facilities and power plants of Central Valley Project and establish a working partnership with the federal government.

Such an operation, PG&E declared, would increase CVP revenues, reduce cost of Central Valley water, save federal tax funds and create new tax revenues for both federal and local governments.

The offer was made at the first hearing of the task force on water resources and power, which is charged with investigation of improvements of rivers, harbors and waterways for navigation; development of flood protection works; improvements for drainage, irrigation, land reclamation, water supply, pollution abatement and recreation; and the generation, transmission and distribution of electric energy. The task force is part of the commission directed by Congress to make recommendations for economy and efficiency in government by elimination of duplication and waste.

PG&E's proposal was presented by Robert H. Gerdes, vice president and general counsel. If his firm took over transmission facilities of CVP, he said, any benefits from purchase of government power would be passed on to all customers instead of the few given preference under the Reclamation Act.

Congressional Study . . . Congress last year directed the Department of Interior to study PG&E's offer to take over transmission facilities of the Folsom Project near Sacramento. PG&E now will go further, and is willing to



Queen Puts Uganda Plant on the Line

Queen Elizabeth II watches water pour through sluice gates of Owens Falls Dam in Uganda after opening the gates by pressing a button. Duke of Edinburgh and Sir Charles Westlake, standing, also watch. Looking on from far bank of the Nile are Busoga natives. The Queen, who later started turbine in the powerhouse, was closely guarded against possible Mau Mau violence. The project will supply power to Uganda and help irrigate the lower Nile.

take over all existing power transmission lines, switchyards and substations of CVP at their present value and to market all project power throughout its 46-county area.

Chamber's Position . . . The California Chamber of Commerce charged that price preferences in sale of government power to public utilities are unfair to private utilities and their customers.

According to James Mussatti, general manager of the California Chamber, the Chamber thinks federal funds should not be used for construction of power facilities where private capital is prepared to provide them.

Two witnesses were on the other side of the fence. They were Charles F. Lambert, representing the Upper Sacramento Valley Irrigation Districts committee, and the California State Federation of Labor, AFL.

"Government and private power should compete," Lambert declared. He said co-existence of private and public utilities is essential to assure agriculture of low cost power.

The AFL statement, prepared by C. J. Haggerty, secretary-treasurer, was read by economist Donald Vial.

He denied that private utilities can provide the answer for development of water and power, saying labor cannot depend on local interests, either private or public, to develop water and power resources enough to keep members at work.

Task Force Moves On . . . Adam Ben Moreel heads the task force, which will hold hearings at later dates in Denver, Chattanooga, New York City and Portland, Ore.

Subway Goes Modern

New York's IRT subway will be getting a "new electric look" now that kerosene lights on the front and rear of subway cars finally will be replaced with electric lamps. The New York City Transit Authority has voted to start immediately a program of light replacement on 1,378 cars which is expected to take four years and cost $550,000. The change-over will result in yearly saving of $89,573 for oil and maintenance.

2nd Group Has Paducah Plan

Syndicate formed in Memphis proposes to supply AEC plant needs in event Congress refuses to expand TVA facilities

A second offer has been received by the federal government from a group of private investors to build a steam plant to supply power for the Atomic Energy Commission installation at Paducah, Ky (EW, April 26, p 7).

The offer was made by the group's attorney in telegrams sent to Sen Leverett Saltonstall (R-Mass.), Sen Lister Hill (D-Ala.), and Roland Hughes, director of the budget.

Lucius Burch, Jr, a lawyer and member of the firm of Burch, Porter & Johnson, Memphis, Tenn., said the offer was made by the syndicate contingent on failure of Congress to appropriate funds for expansion of the Tennessee Valley Authority.

AEC Would Get Plant . . . The plant would become the property of AEC "without further investment on its part" at the end of the contract period, Burch said.

Burch declined to identify the firms which made the offer, except Gibbs & Hill Inc, New York, the combine's engineering firm. But he said there are "several of them, interested in various phases of the project and they are among the biggest financial interests in the country."

"It is a syndicate," he said, composed of companies already in the business of generating power and consisting of institutions and lending agencies who have large funds for long-term investments.

"I cannot emphasize too strongly the size and financial backing of these people."

"The people of Tennessee and the Tennessee valley are very much alarmed at the prospect of having the Senate appropriations for expansion of TVA defeated," said Burch's telegram. "If these appropriations are not made, it then seems logical that the Administration will seek the best competitive offers from private interests to furnish power for AEC."

Burch said the proposal he is authorized to offer AEC will be better than that which has been made "in at least these particulars:

- "The cost per kilowatt of generating capacity will be lower.
- "The cost of power to the AEC will be lower.
- "The plant would be built at a site specified by AEC.
- "At the end of the contract period, the plant will become the property of AEC without further capital investment on its part."

Middle South Utilities, Inc, and Southern Co have been negotiating jointly with the government for the past few weeks to build a plant at West Memphis, Ark.

The proposed plant was estimated to cost between $100-117 million dollars and would produce 600,000 kw which would be funneled to the AEC installation at Paducah, Ky.

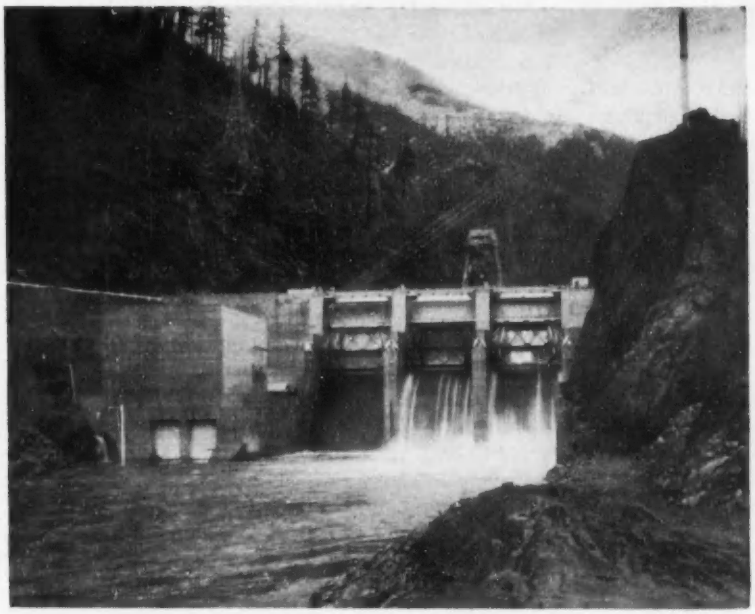
Niagara Vote . . .

. . . in Senate Public Works Committee nears as hearings end on various bills offered

The Senate Public Works Committee finally wound up its year-long hearings on power development at Niagara Falls last week. With several staff reports still to be prepared for the committee, however, Chairman Edward Martin (R-Pa.) said it would be a "couple of weeks" before committee members vote on the various bills under study.

Last witness at the hearings was Sen Francis Case (R-S.D.), author of one of the pending bills and a committee member. Other bills include one by Sen Irving M. Ives (R-N. Y.) to allow New York State to develop Niagara power with no preference clause for public or co-op use; one by Sen Herbert Lehman (D-N.Y.) to allow state development but with a federal-type preference clause written in the license; and one by Sen Homer E. Capehart (R-Ind.)—which already has received House endorsement—to allow development by five New York private power companies.

FPC Choice . . . Senator Case's bill would allow the Federal Power Com-



At Big Cliff Dam on the North Santiam . . .

. . . the Corps of Engineers will be testing an 18,000-kw generator this month. Big Cliff is a reregulating structure in Oregon's Willamette Basin. This and Detroit Dam, where a 100,000-kw plant was dedicated by the Engineers last June, are the first basin projects with power facilities. Transmission towers from the Detroit powerhouse, feeding into the Bonneville Power Administration grid, are visible on the rugged Cascade Mountain slope at left.

mission to decide who shall construct and operate new power facilities at the Falls, but leaves out any preference clause. Case said it would be "inconsistent" to allow New York State to undertake the project and then deny it the right to decide how the power should be distributed.

The South Dakotan Senator agreed with the position taken recently by Robert Moses, New York Power Authority chairman, that any bill—such as the Miller-Capehart bill—turning over resources at the Falls to private interests would run afoul of the courts.

At a committee hearing last week, Senator Lehman and Rep Franklin D. Roosevelt, Jr, New York State Democrats who favor public development of the Falls, made their last appeal. Lehman said he and FDR, Jr, see "eye to eye" with Governor Dewey, Senator Ives, and Robert Moses on the "inequity" of turning over Niagara power resources to private interests.

"Where we differ," he said, "is that Dewey (and the others) wants absolutely no safeguards on preference." Lehman asserted the preference clause would serve as a "yardstick" to measure costs of power sold to co-ops and municipalities under it, against that sold to other consumers by private companies.

This would encourage competition in electric power rates in New York, he said, and result in cheaper power, attracting in turn new tax-paying industry to the state.

'Giveaway' Charged . . . Representative Roosevelt and Sen Wayne Morse (Ind-Ore.) denounced the tactics of both the interested private companies and Governor Dewey. Morse called Dewey's proposal (possible under both the Ives and Case bills) to permit private companies to take state-generated power at bus bar a "subsidy" and a "tremendous giveaway."

FDR, Jr, noting that co-ops and municipalities would use at most only 10% of the power from additional Falls development under a preference clause, said the private companies talk as "if we were socializing a whole industry, so afraid are they of that 10% yardstick."

9 Atomic Bids . . .

. . . were made on AEC contract won by Duquesne Light to build first commercial nuclear power plant

Nine electric comanies and industry groups made separate offers to collaborate with Atomic Energy Commission in building and operating the first utility-size atomic power plant in the country.

Full list of bidders was disclosed last week for the first time although the Duquesne Light Co offer had been accepted more than a month earlier (EW, March 22, p 90). This plant is now in the design stage at Westinghouse Electric Corp in Pittsburgh and will be erected on land furnished by Duquesne Light near Pittsburgh. AEC Chairman Lewis Strauss has estimated a saving of $30 million to government.

The Other Eight . . . Besides Duquesne Light, these eight firms and groups also offered "broad scale" participation in the large scale atomic power plant project:

1. Cisco Construction Co, Portland, Ore.
2. Connecticut Light & Power Co, Berlin, Conn.
3. Consumers Public Power District, Columbus, Neb.
4. Eastern Utilities Associates, Boston, Mass.
5. Middle South Utilities, Inc, and Ebasco Services, Inc, New York City.
6. Nuclear Power Group: American Gas & Electric Service Corp of New York; Bechtel Corp and Pacific Gas & Electric Co of San Francisco; Commonwealth Edison Co of Chicago; and Union Electric Co of St. Louis, Mo.
7. Philadelphia Electric Co and Pennsylvania Power & Light Co.
8. South Carolina Electric & Gas Co.

In addition, offers were received from the following for "very limited" participation:

1. Infilco, Inc, of Tucson, Ariz.
2. Lenoir and Morganton, N. C., communities.
3. R. B. MacKenna, an electrical engineer, of Santa Fe, N. M.
4. Reynolds Metals Co of Richmond, Va.
5. Sylvania Electric Products, Inc, of Bayside, N. Y.

IN THE INDUSTRY

NRECA lauds Georgia PSC on fast amortization

The National Rural Electric Cooperative Association recently passed a resolution praising the Georgia Public Service Commission's treatment of accelerated amortization and condemning some 20 other commissions. We believe that in arriving at this resolution the intent of Congress in granting industry engaged in the defense effort a temporary deferral of federal income taxes, has not been given consideration.

The intent of Congress with respect to accelerated amortization is clear and unequivocal. It is to promote the rapid expansion of our defense facilities by the attraction of private capital. There is nothing in the law to indicate that Congress intended to treat the private electric utilities any less favorably than the rest of American industry nor that the temporary savings arising from the tax deferral were to accrue to the ultimate consumer.

NRECA Praise Difficult to Understand . . . The praise which the NRECA bestowed on the Georgia PSC is difficult to understand. The fact is that the commission seems to have ignored the intent of Congress with respect to accelerated amortization. It also deprived the company's stockholders of the benefits which were theirs.

Specifically, the resolution of NRECA stated that: "The federal accelerated tax amortization program has, in effect, resulted in interest-free loans to commercial power companies exceeding $800-million with ultimate benefits flowing to these companies, in excess of $2.8 billion." The fact of the matter is, of course, that there are no tax savings since the taxes temporarily deferred during the five years will be paid out over the span of the life of the property. The only benefit which accrues to the companies is the present value of the availability of the funds during the five-year period instead of over the normal life expectancy of say 30 years. This amounts to $377 million and not the $800 millions mentioned in the resolution.

As to the figure of $2.8 billions, in the absence of a more specific definition of what "ultimate benefits" means, it is difficult to determine its origin.

Resolution Continues . . . The resolution goes on to say in part that: ". . . we commend this information to the attention of members of Congress, state utility regulatory bodies, and to all of our members, in order that the information may be appropriately utilized to procure lower wholesale power rates, which such utility benefits should permit, and to counter and offset utility company statements and campaigns that insinuate our members benefit from subsidies, while commercial companies allegedly pay their own way without any form of government aid;

BE IT FURTHER RESOLVED, that we commend the Georgia Public Service Commission on its decision on the handling of accelerated amortization certificates because its decision protects the electric consumer."

We believe that the decision of the Georgia PSC not only "protects" the electric consumer, but that goes much farther than that. It appears to give him a windfall toward which he made no contribution whatsoever.

The resolution concludes by saying: "BE IT FURTHER RESOLVED, that we condemn the decisions of the 20 other state utility regulatory commissions, and the recent decision of the Federal Power Commission as leading to unwarranted and unjust subsidies to private utility investors at the expense of electric consumers."

It is not clear what is meant by unwarranted and unjust subsidies to private utility investors since all the commissions, and especially the Federal Power Commission, have indicated in their orders that accelerated amortization is not to be considered a vehicle for the payment of additional dividends to utility stockholders.

We believe the NRECA should reconsider its action in the light of the factors pointed out above. Certainly the Public Service Commissions can never be accused of neglecting the electric consumers.

TECHNICAL NOTES

ARCHER E. KNOWLTON

Induction generators make attractive for development small hydroelectric sites with heads of 20 ft or more which would otherwise be impracticable.

Flicker is sometimes observable at the ends of fluorescent lamp tubes operated at 60 cps. It is hardly detectable at 360 cps.

Fuse links will generally not follow their normal heating curves once they have been brought to the melting point by a fault current that was interrupted by other means.

Large buildings cause radio propagation loss that may be 25 db greater than the plane earth values for the same distance and antenna height. Standing waves may superpose substantial variations within one foot.

Control room lighting in emergency can consist of strategically placed incandescent lamps supplied from the station battery.

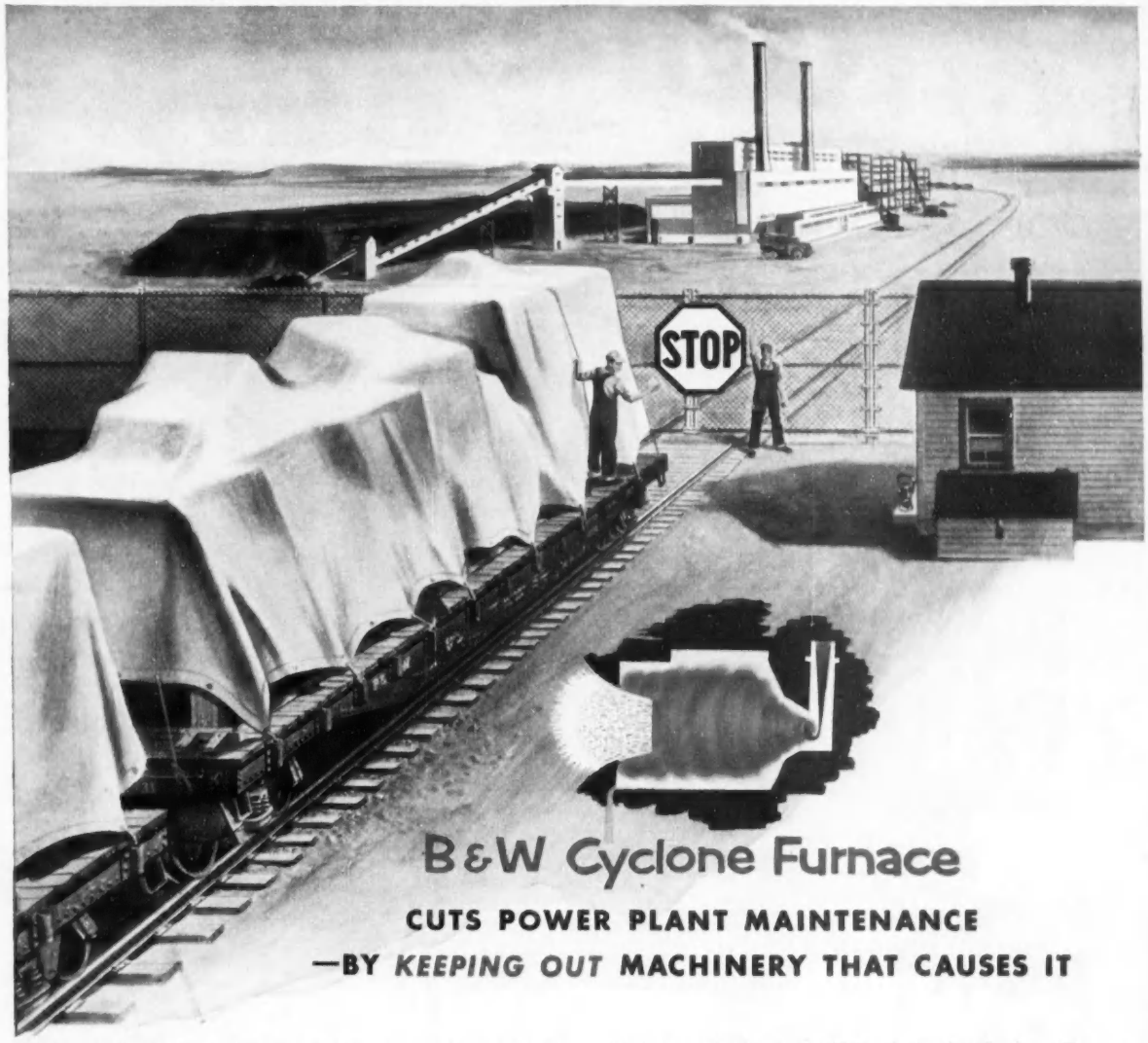
Bandwidth required for frequency modulation of a 3-kc voice band must be at least ±3 kc. For reasonable FM signal-to-noise advantage the frequency swing should be at least ±5 kc. This requires a bandwidth of ±8 kc for good quality.

Steam generation within the water in which fissionable material is allowed to react would simplify the power reactor application to electric generation.

Metallic whiskers of elongated crystals growing from metallic surfaces have been found to be the explanation for obscure short-circuiting of air capacitors in electronic circuits.

Phenolic resins have polymeric chains so highly interconnected into 3-dimensional networks that the molecular weights may generally be considered infinite.

Aging embrittlement of either low-carbon fully austenitic or low ferrite-bearing weld metal applied to high-pressure piping can be inhibited by post-welding solution heat treatment at 1,900-2,000 F.



B&W Cyclone Furnace

CUTS POWER PLANT MAINTENANCE —BY *KEEPING OUT* MACHINERY THAT CAUSES IT

That trainload of cumbersome coal preparation and ash handling machinery represents a heavy, endless load of costs for many coal-burning power plants. The constant attention and maintenance required by coal pulverizers, with their motors and controls; burners and piping; cumbersome hot-air ducts, fly-ash precipitators and ash collection and disposal systems . . . all add up to expense that can now be eliminated.

Burning coal that is merely crushed, the B&W Cyclone Furnace makes possible substantial savings in maintenance through elimination of much of the coal preparation equipment. And the Cyclone burns coal in such a way as to keep the resulting ash *out* of the boiler and stack . . . converting it into easy-to-handle, easy-to-dispose-of slag . . . thus simplifying or eliminating a considerable share of the ash precipitating, collecting, handling and disposal system.

The Cyclone Furnace offers many other advantages . . . higher combustion efficiency, easier conversion to gas and oil, savings in first cost, increased safety, and simplified arrangement for remote-control operation.

A high percentage of all bituminous coals in the United States can be burned efficiently in the Cyclone Furnace. It can handle a wide variety of coal from mines in all parts of the country. Regardless of where a coal-burning plant may be located, it will have an excellent competitive market in which to purchase coal suitable for firing in the Cyclone Furnace.

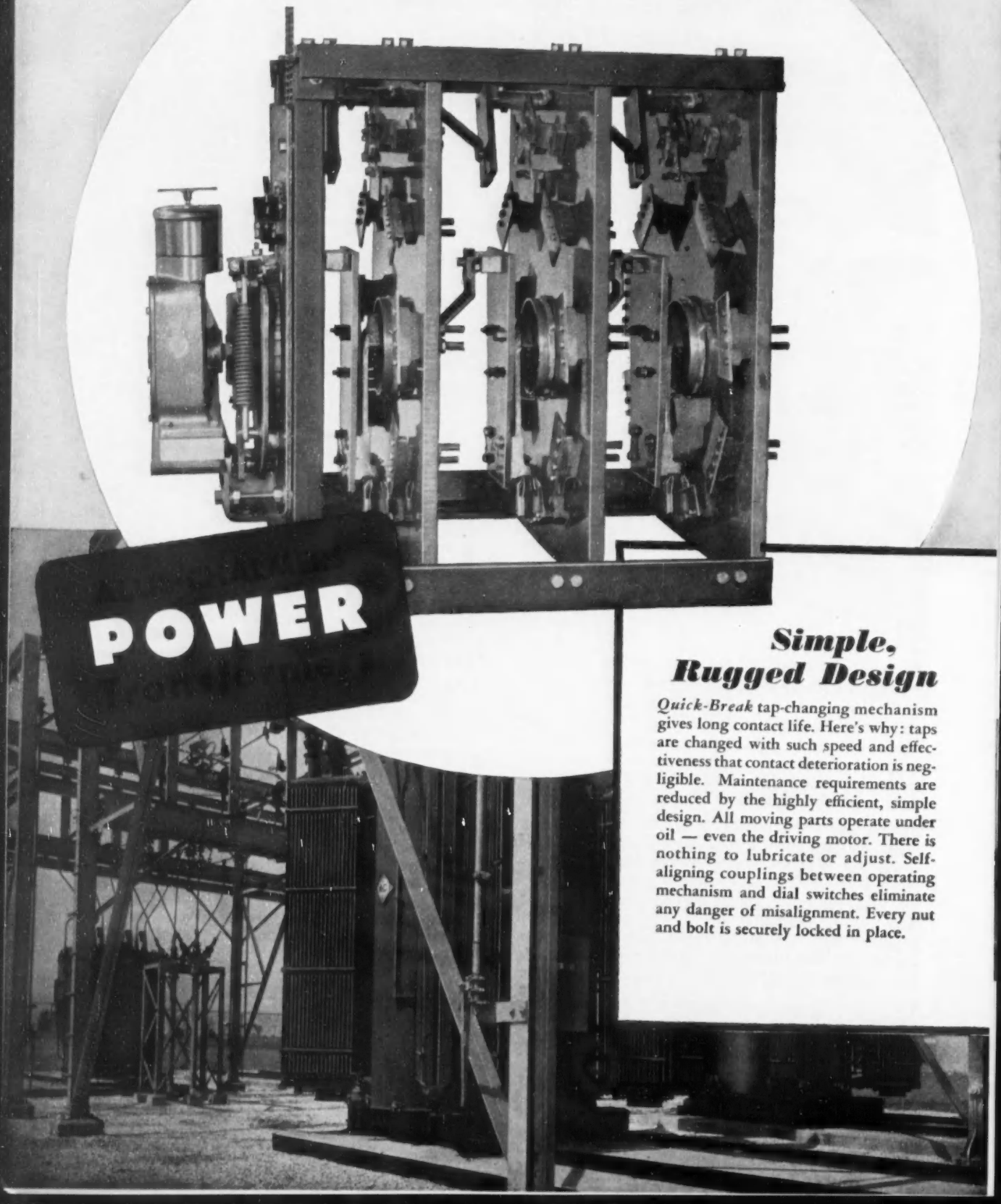
Substantial dollars-and-cents benefits are being enjoyed by owners of the many boilers fired with Cyclone Furnaces which are now in operation—under a great variety of conditions—in different parts of the country. Based on this intensive, long-range experience, we will be pleased to discuss with you the many advantages the Cyclone Furnace offers.

The Babcock & Wilcox Company, Boiler Division,
161 East 42nd Street, New York 17, N. Y.

BABCOCK & WILCOX
BOILER DIVISION

N-170

20 Years'



Simple, Rugged Design

Quick-Break tap-changing mechanism gives long contact life. Here's why: taps are changed with such speed and effectiveness that contact deterioration is negligible. Maintenance requirements are reduced by the highly efficient, simple design. All moving parts operate under oil — even the driving motor. There is nothing to lubricate or adjust. Self-aligning couplings between operating mechanism and dial switches eliminate any danger of misalignment. Every nut and bolt is securely locked in place.

Field Proof-

Here's the Tap-Changing-Under-Load Mechanism That Has Given 20 Years of Unequalled Performance

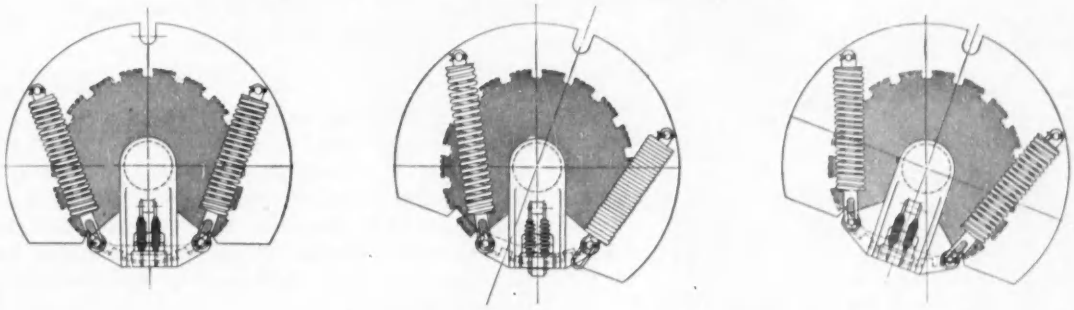
Field-proved — and unsurpassed in twenty years — that's the story behind Allis-Chalmers famous *Quick-Break* tap-changing mechanism. No other tap changer on the market gives you its combination of ruggedness, accuracy, and simplicity — features that add up to practically trouble-free operation.

Laboratory-proved — tests show that the *Quick-Break* mechanism will withstand 5 million operations — equivalent to over one hundred years of normal service. The *Quick-Break* mechanism was designed to operate under the most difficult conditions. After twenty years of field operation, it is still the simplest, most efficient means of changing taps under load.

Get More Facts. If you don't have all the facts already, it will pay you to get more details by contacting your nearby Allis-Chalmers office or writing Allis-Chalmers, Milwaukee 1, Wisconsin.

6-4193

How It Works



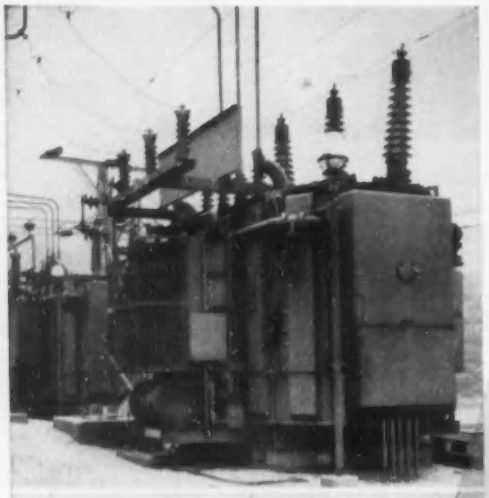
1 Dial switch operates on the balanced spring principle. Components include outer moving segment, inner stationary index plate, and powerful springs for fast drive snubbing action.

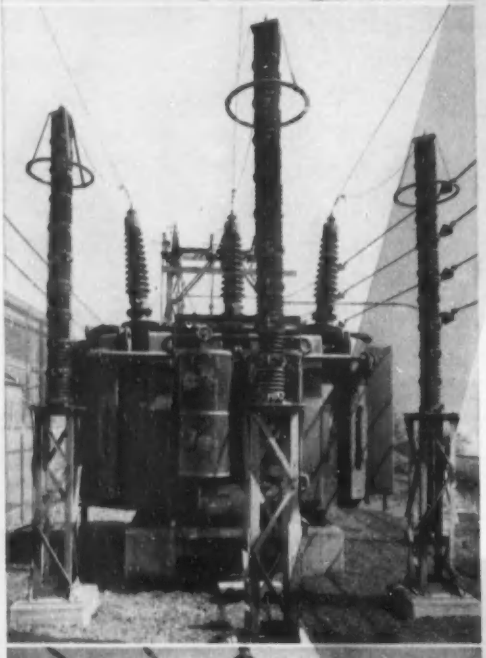
2 Start: driving motor rotates outer segment but latch on crank arm holds tap switch in position. Heavy-duty springs store energy to produce quick start and stop of switch.

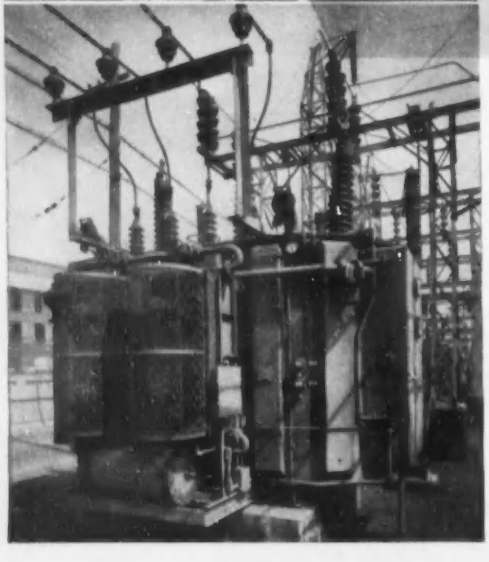
3 Finish: cam on segment lifts latch. Released spring tension rotates switch swiftly to next operating position. Latch locks switch and places mechanism in position for next change.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS







...Four 30,000 kva PENNSYLVANIA TRANSFORMERS

supply the power requirements of the Brackenridge plant of ALLEGHENY LUDLUM STEEL CORPORATION

Each of these transformers is rated at 30,000 Kva, 3 Phase, Oil-Immersed, Forced-Oil-Cooled. Together, the four transformers supply 120,000 Kva of power to the Brackenridge Plant. But as usual, there is more to the story than the rating of the transformers.

Here are four transformers that were designed to rigid height limitations so they could be delivered by trailer truck to their installation sites. The voltage — 132 Kv — called for intricate engineering and strict attention to mechanical detail.

The first unit to be installed at Brackenridge illustrates how carefully the design was worked out. The transformer was trucked over 44 miles of first and second class highway and rolled off the trailer onto its foundation — all in one day. To reach Brackenridge, each transformer had to be light enough to go over bridges, small enough to go under viaducts, and properly distributed in weight to negotiate sharp curves with safety.

For a better picture of how this was done, we invite you to write us on your letterhead to arrange for a showing of our 16mm. black and white movie entitled "30,000 Kva En Route."

Pennsylvania Transformer Company

A McGraw Electric Company Division • **Canonsburg, Pa.**

GREATER PITTSBURGH DISTRICT

No Showdown

Widely advertised denouement fails to develop as Interior, Georgia Power and co-ops meet to settle Clark Hill dispute

Three recent "showdown" meetings between government, cooperative and electric company officials failed to produce agreement on the marketing of power from the federal Clark Hill Dam.

At issue is whether Interior Department will go through with its proposed tri-contract method for disposing of Clark Hill power in Georgia. This proposal calls for Interior to sell power to Georgia Power Co for transmission to rural electric cooperatives and other preference customers in Georgia (EW, March 1, p 6).

Long Fight . . . The co-ops, through their counsel, former Gov. Ellis Arnall, have fought a delaying action on the proposal since it was put before them Feb. 17. Main argument has been that the Interior plan would deprive preference customers of original title to the power which they claim is their under law.

Arnall first requested 30 days to study the proposal. Later he asked and was granted another 30 days bringing the extension of time to April 17. At a meeting April 19 with Interior officials, the co-ops asked that they be allowed to participate in a three-way meeting with Interior and Georgia power officials. This was granted.

Meetings were held April 26, 28 and May 1 at Interior Department with all three sides represented. Spokesmen had billed each of the meetings as a "show down" session and promised to come up with some sort of working agreement. However, at the close of each of these get-togethers Assistant Interior Secretary Fred G. Aandahl reported there was nothing to announce.

Clampdown on the News . . . At the close of the May 1 meeting, Aandahl would not say whether further sessions were to be held. A tight clampdown on information regarding the sessions appeared to be about the only mutually-agreed step toward solving the difficulties.

The interior proposal for marketing the power in Georgia represents a drastic departure from the direct sale of power to preference customers, long practiced by Democratic Adminitsrations. The Georgia marketing decision is awaited as a possible precedent for the Eisenhower Administration's federal power marketing procedures.

MSP Sets Valuation on Lines Eugene Seeks

Mountain States Power Co has put a value of $1,750,000 on distribution facilities in the Willakenzie and Glenwood neighborhoods which are involved in condemnation suits by Eugene, Ore., Water & Electric Board.

MSP asserts in its answer to EWEB's suit that the approximate 50 miles of distribution line serving 2,200 customers involves severance damages to the private utility above the $1,350,000 the municipal system offers for the properties.

EWEB filed in Lane Circuit Court Dec. 16, 1953 but the complaint did not allow for severance damages. MSP filed its answer March 23.

Condemnation proceedings were undertaken by the Eugene Board after negotiations over a lengthy period had failed. The districts involved are outside Eugene's municipal limits, but the city justifies its suit on the ground the districts eventually will be incorporated into the Oregon municipality. The two neighborhoods lie between Eugene and the neighboring city of Springfield.

Jubilee Commemoration at Ford Museum

Replica of apparatus with which Thomas A. Edison caused a glow on a filament in a vacuum bulb 75 years ago is center of attraction during visit of a group of students to inventor's Menlo Park laboratory, restored and reconstructed by Henry Ford at Greenfield Village, Dearborn, Mich.

The laboratory is one of the exhibits featured during commemoration of Light's Diamond Jubilee and the 25th anniversary of the Henry Ford Museum and Greenfield Village. Special activities marking the two anniversaries began this month and will continue through November.

Special displays arranged by the Museum and Village in cooperation with Detroit Edison Co, General Electric Co, and Westinghouse Electric Corp. include an exhibition telling the story of lighting and lights from the days of the Pilgrims to the present: "The Light We Live By;" a light treatment of entertaining and educational application of modern lighting and lamps; "Light Sorcery;" operation of Edison's original Menlo Park generators and lighting system; and activation of Detroit's first central power station.

● Pres Henry Sargent of Arizona Public Service this year showed his organization to stockholders as big as life—and just as deep. Sargent, who's great on promotional gimmicks, produced a three-dimensional slide presentation that amounted to a pictorial annual report. He showed it at the annual meeting and plans to take it on the road to give civic clubs, schools and similar groups a visual run-down on the company and its operations.

In 3-D color charts and graphs he explained the company's customers had increased 15,000 during the year, bringing the total number to 252,768; that total revenues for '53 were $31,446,000; that a breakdown of the revenue dollar showed 71¢ of each dollar coming from electric sales, 26¢ from gas and 3¢ from water and other sources.

The stockholders kept their polarized glasses on their

ARIZONA PUBLIC SERVICE STOCKHOLDERS leaving the annual meeting were nudged on the 75th anniversary of the incandescent lamp by this display at the entrance of Phoenix Little Theater, where 3-D show was staged

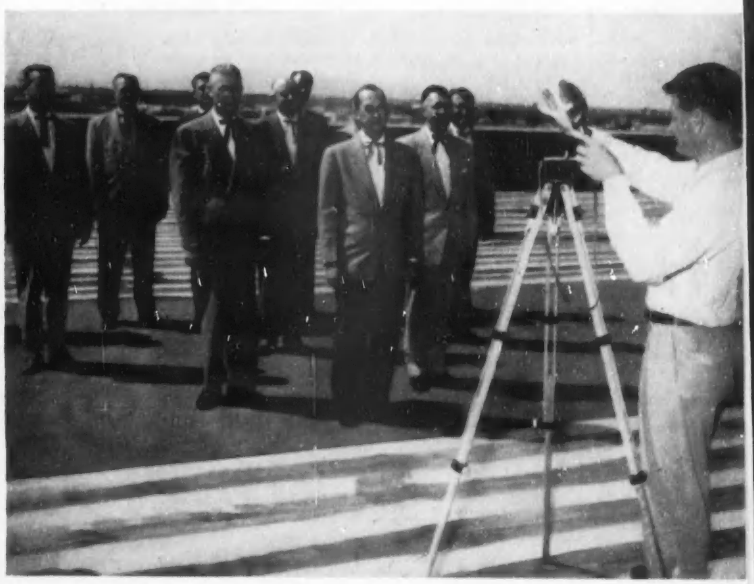
Officers of Arizona Public Service stand out in bas-relief as stockholders in the Phoenix Little Theater watch . . .

An Annual Report in Three Dimensions

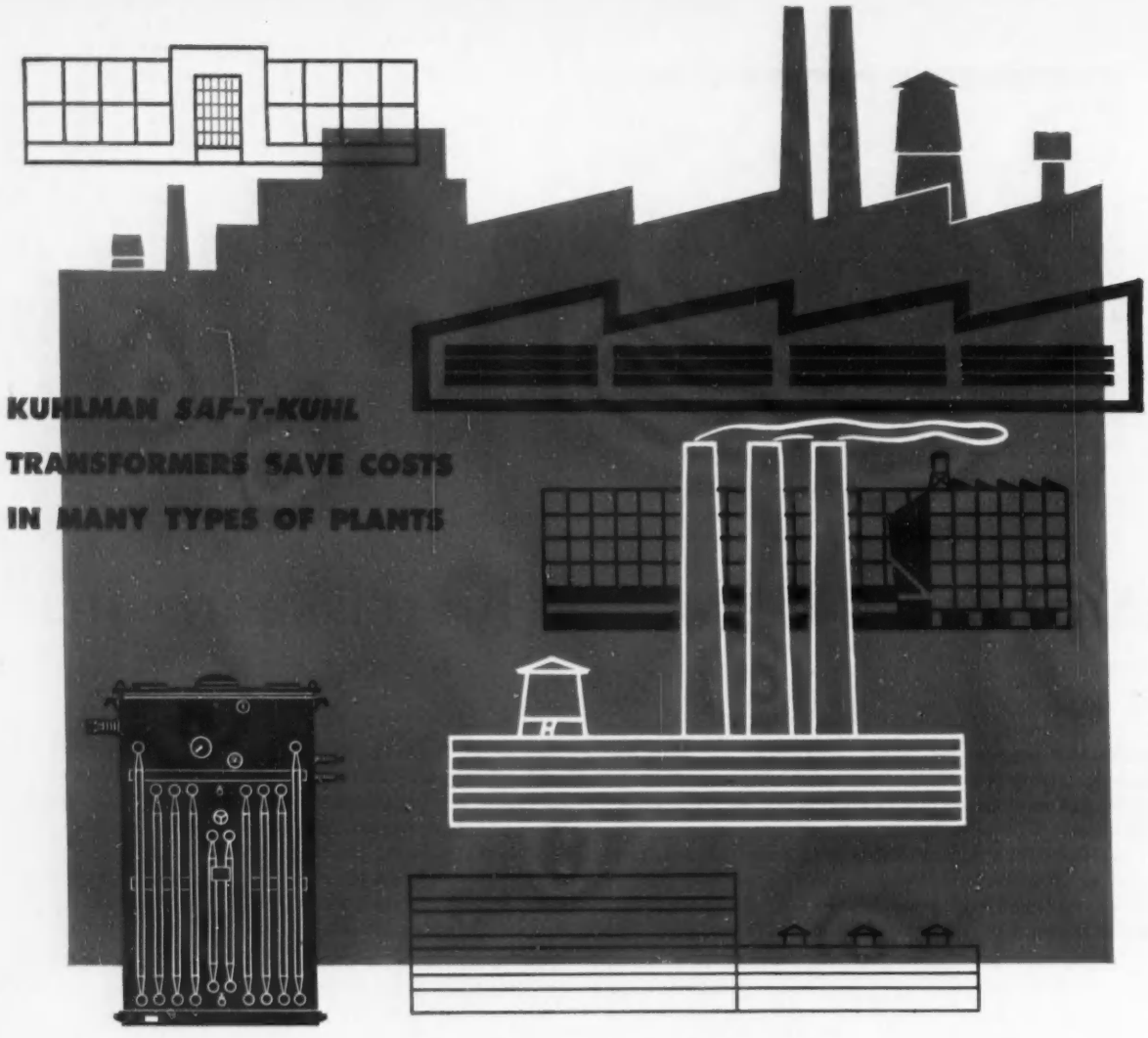
heads and lent an ear. That's the idea, according to Sargent. He likes a different approach to stockholders to get maximum response and pep up interest in stockholder meetings.

He likes to entertain as well as get his story across. One year he used Venetian blinds painted in various colors. As he explained the company's growth, he hoisted the blinds higher and higher to animate the idea. And another time his gimmick was black light played on a mammoth book whose pages were turned by mechanical arms. Statistics on the company's operations for that year were printed in fluorescent hues, and under black light told the story brightly.

It draws crowds, Sargent figures. And, too, he gets to know his own stockholders in 3-D, rather than as 1-D names on the company's books.



HOW THE 3-D SHOTS WERE MADE: Company photographer, left, photographed wood-block bar chart. Above, he forms living organizational chart with Pres Henry Sargent at its head



KUHLMAN *SAF-T-KUHL* TRANSFORMERS SAVE COSTS IN MANY TYPES OF PLANTS

The advantages of Kuhlman Saf-T-Kuhl Transformers, employing a fireproof coolant, are well known.

- You save installation time and costs because Saf-T-Kuhl Transformers do not require expensive fireproof vaults.
- You save on materials because electrical circuits can be divided into several sections with a transformer at the center of each section. The expense of running long and large copper conductors as secondary lines is eliminated and better voltage regulation and reduced energy losses result.
- You save on maintenance costs because the cooling fluid in Saf-T-Kuhl Transformers never has to be filtered or reconditioned—it will not sludge.
- You save on insurance rates in most states because Saf-T-Kuhl Transformers are absolutely safe and fireproof.
- You save on floor space because Saf-T-Kuhl Transformers can be installed above or below floor level or as a component of a modern switchgear installation.

Kuhlman Saf-T-Kuhl Transformers are filled with an inert synthetic cooling compound that is non-explosive and non-inflammable. They are engineered to meet the requirements of heavy duty industrial service. Tanks are completely sealed. Cover and bushing gaskets are made from a special cork and synthetic rubber compound that gives exceptionally long life. Assembly operations are performed by highly skilled electrical craftsmen, and each transformer is thoroughly inspected and tested. For complete information about Saf-T-Kuhl Transformers, write for Bulletin CS 501. Kuhlman also manufactures Power, Distribution, Dry Type, Subway, CSP and Series Street Lighting Transformers. Ask for bulletins on these units as well.

154-M

KUHLMAN

KUHLMAN ELECTRIC COMPANY, BAY CITY, MICHIGAN • Southern Division, CRYSTAL SPRINGS, MISSISSIPPI

EXPORT REPRESENTATIVE: INTERNATIONAL STANDARD ELECTRIC CORP., 15TH FLOOR, 50 CHURCH STREET, N. Y. 7, N. Y. CABLE ADDRESS: MICROPHONE, N. Y.

SIXTY YEARS OF PROGRESS IN THE ELECTRICAL INDUSTRY

EEI Parley Linked to 'Jubilee'

Slated for June 1-3 at Atlantic City, group's meeting to be highlighted by industry's 75th anniversary and resort's centennial

When Edison Electric Institute holds its 22nd annual convention this year in Atlantic City, N. J., the meeting will be highlighted by the dual celebration of Light's Diamond Jubilee and resort city's centennial. The city will concentrate its observance of these two events in the 100 days following the start of the convention. The meeting dates are June 1 through June 3.

Convention Program . . . Tentative convention program calls for five general sessions devoted to a tribute to Thomas A. Edison and talks on power marketing and atomic energy, atmosphere for industry development, future industry prospects, and finance. All the sessions will be held in the Ballroom of the Atlantic City Convention Hall.

The session lauding Thomas Edison's achievements will hear an address on Light's Diamond Jubilee by Charles E. Wilson, former president of General Electric Co, honorary chairman of the Jubilee.

Scheduled to analyze power marketing is George M. Gadsby, president of Utah Power & Light Co. This general session will also hear talks on atomic energy. Progress in the field will be reviewed by Robert LeBaron, assistant to Secretary of Defense for atomic energy, and chairman of the military liaison committee to Atomic Energy Commission. Prospects for use of atomic energy in generation of electric power will be explored by Dr John Dunning, dean of engineering, Columbia University.

Selling for Future Load . . . At the session on "Atmosphere for Development," Sherman Knapp, president of Connecticut Light & Power Co, will discuss selling for the future load. Talks on engineering and operations improvements will be delivered by E. H. Snyder, Public Service Electric & Gas Co, and Stuart Campbell, of Booz, Allen and Hamilton, respectively.

In keeping with the third general session's theme of "Looking Ahead," Walker L. Cisler, president of Detroit Edison Co and chairman of the EEI power survey committee, will present his views on the subject at the meeting. At this same session, customer relations will be discussed by Henry B. Sargent, president and general manager, Arizona Public Service Co. A talk on area development will be made by C. Hamilton Moses, chairman of the board of Arkansas Power & Light Co.

FPC's Kuykendall to Speak . . . Jerome K. Kuykendall, chairman of the Federal Power Commission, will speak about rates and securities regulation by FPC when he addresses the fourth general session.

Presentation of the Charles A. Coffin Award Wednesday evening, June 2, will be part of the special entertainment to be offered at the Warner Theatre on the Boardwalk. Westinghouse Electric Corp will present the Robin Hood Dell Orchestra under the baton of Percy Faith and featured entertainer will be Victor Borge, pianist and radio-TV personality. Betty Furness, of TV and motion picture fame, will be mistress of ceremonies.

EEI will play host Wednesday afternoon to the ladies at a luncheon and fashion show at Trimble Hall, Claridge Hotel.

2 More British A-Plants

Lloyd's Register of Shipping, worldwide classification society, will supervise construction of two atomic energy plants for production of electric power on shore. The plants, to be built in England, will be identical and will require three years to complete. The atomic project will be part of the society's non-marine work which has grown rapidly in recent years.

POWER BRIEFS FROM THE NEWS

● Cleveland Electric Illuminating Co has received National Safety Council's award of honor for 1953. In making the announcement, Pres Elmer Lindseth declared: "This award, the highest granted by the Safety Council, caps a five-year record of improvement which reduced our lost-time injuries by 87% between 1948 and 1953." He said that last year the company's accident record was less than one-third that of the electric utility industry nationally.

● Newfoundland Premier Joseph Smallwood has announced British-Newfoundland Corp is surveying Labrador's Hamilton River for possible power development. The premier said the river has a hydroelectric potential surpassing that of Niagara Falls and that a possible 10 million hp could be developed from the Hamilton River's Grand Falls and its watershed.

● New units have been placed in service by Central Power & Light Co and Pennsylvania Electric Co. Central P&L's Lon C. Hill power station near Corpus Christi, Tex., went into operation April 4. Its 66,000-kw generator is the largest single unit ever installed in a CP&L plant. First of two 137,500-kw units was put on the line by Penelec at its $40 million Shawville generating station near Clearfield, Pa.

● Georgia Power Co is surveying several locations on the Tennessee River near Huntsville, Ala., as a possible site for a steam plant to supply its own customers. One of the locations is a site owned partly by Tennessee Valley Authority, which has rejected Georgia Power's offer to build a plant on the river to supply power to TVA and its customers.

● Tacoma Public Utilities Board members last month withdrew financial support from Pacific Northwest Utilities Conference Committee. The board will maintain temporary membership on a nonparticipating basis. Board Chairman Garret VanderEnde said the board felt the time had come to "quit going to Washington, D. C., and asking for something but going ahead and doing it ourselves." Conference committee chairman is C. A. Erdahl, recently removed as acting Tacoma utilities director.

Brazil's Power Plan

Vargas sends bill to Congress creating company to administer electrification program

RIO DE JANEIRO (Reuters)—President Getulio Vargas has sent two bills to the Brazilian Congress, one creating a nation-wide electrification plan and the other creating a company to administer it under the name of Electrobras.

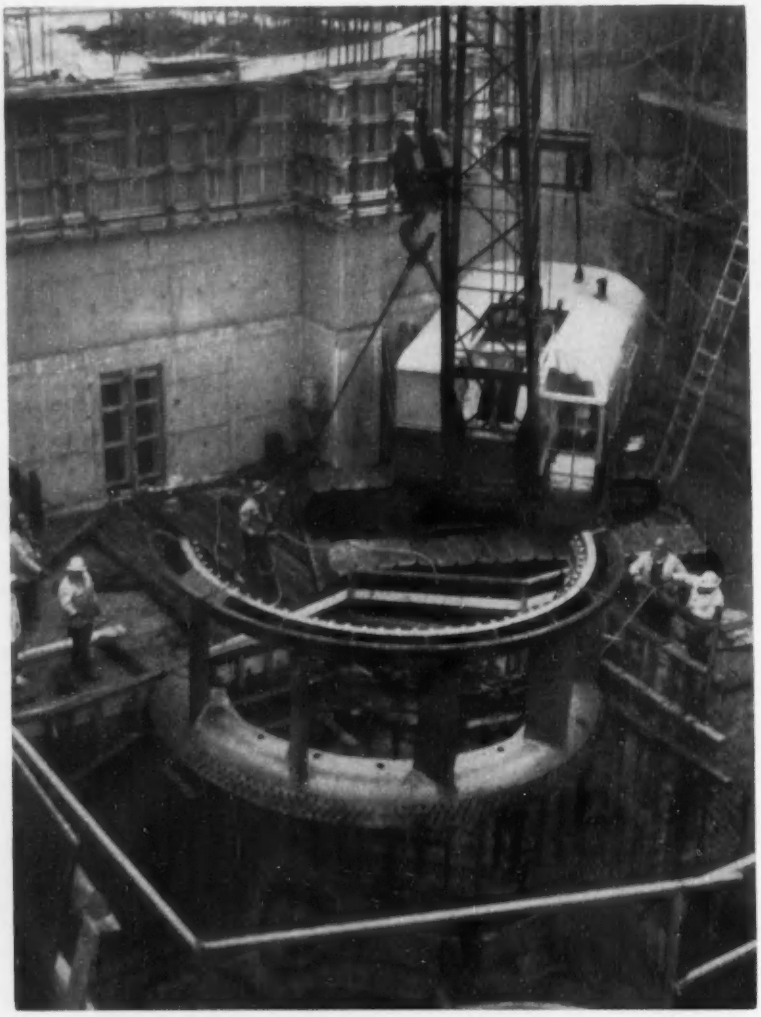
The electrification plan is of ten years duration and its objective is to more than triple present capacity, raising it from 2,500 million kw at present to 8,000 million kw. Total expenditure involved is estimated at 32,397,600 cruzeiros.

Construction Program . . . It is planned to construct new power plants, connect existing plants with one another and with new ones and to standardize current frequencies. The country would be divided into two areas—one called preferential, to be supplied by an interconnected system of large power stations, and a second area to be served by small stations.

To carry out the plan, a domestic heavy industry would be established to manufacture electrical equipment and machinery. This industry, the President states, must be developed to supply at least 50% of all the equipment needed for the plan.

National Company . . . The second bill deals with the setting up of Electrobras. The firm would have an initial capital of 3,000 million cruzeiros to be supplied by the federal government in the form of all the "assets and rights relative to the electricity industry that the government already has." If this were not sufficient, the difference would be made up in cash. Shares would be sold to increase original capital.

The bill says that only with the approval of the President, after consulting with the National Water and Power Council, may Electrobras take shares in distributing and production companies of electric power which are not subject to control by the Union, the States, the Federal District or the municipalities. This has a bearing on the Brazilian Traction, Light & Power Co and American and Foreign Power Co which produce and distribute about 80% of Brazil's power.



Turbine Stay Ring Lowered into Place

Turbine stay ring section is lowered into position for installation in the South Colton hydroelectric powerhouse being constructed by Niagara Mohawk Power Corp on the Raquette River in New York State. The plant is one of five being built by the utility along the river. The completed turbine unit will produce 25,400 hp at 120 rpm under 82.7 feet net head.

Engineering Study Made on Priest Rapids Dam

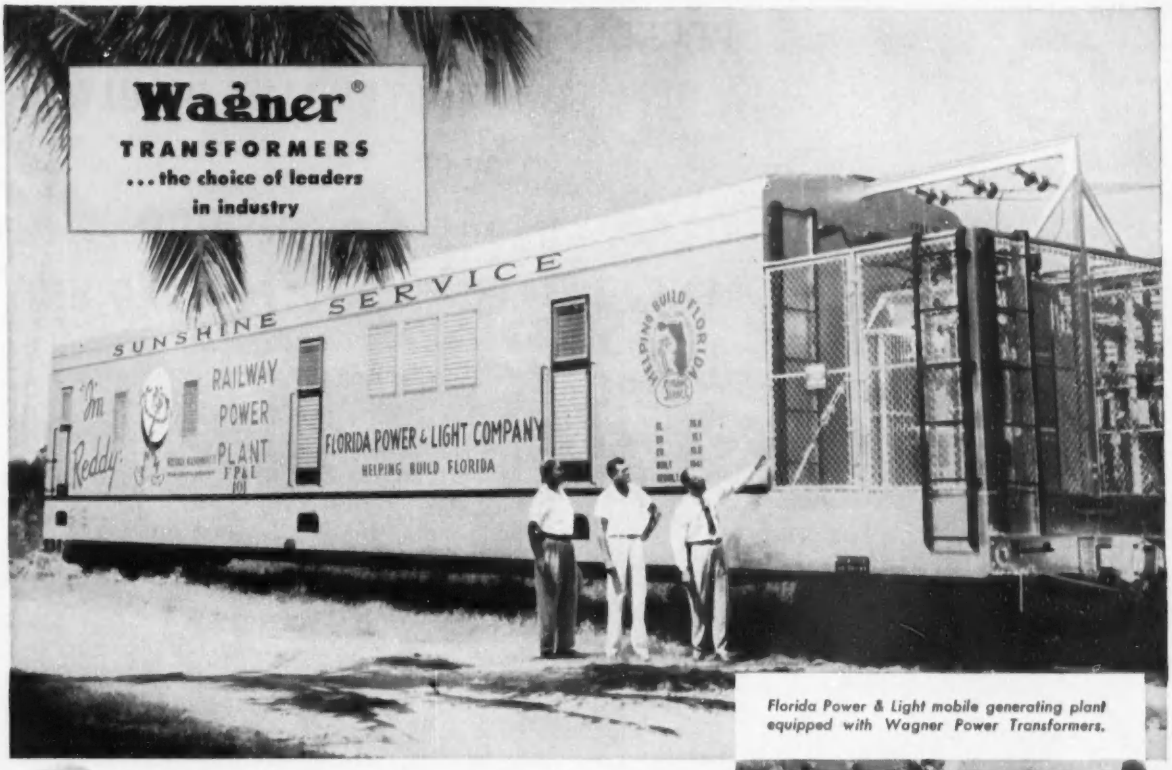
Some details of the engineering report on Priest Rapids site on the Columbia River, where a group of Washington PUD's seek to build a large hydroelectric dam, were made public last month by Cowlitz County, Wash., PUD manager Glenn Hittle.

Hittle reported the engineering study shows that two low dams would cost $358 million and produce 7,740,000,000 kwhr annually. A single large dam would cost $412 million and have an output of 8,390,000,000 kwhr.

Text of the report, Hittle declared, specified:

"The studies . . . indicate the development of hydroelectric power at Priest Rapids is technically and economically feasible, either with a two-site or single-site development. The construction of either of the developments represents a sound venture."

Bill to transfer construction authorization from Army Corps of Engineers to PUD's is pending in Congress.



Florida Power & Light mobile generating plant equipped with Wagner Power Transformers.

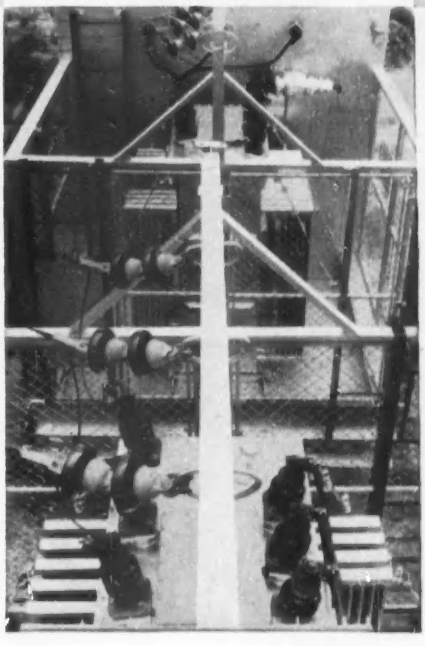
clear the track for Sunshine Service

Power's on the move in fast-growing Florida, as evidenced by this unique, modern generating-plant-on-wheels operated by Florida Power & Light Company.

Mounted on a special 74-foot former circus train flat car, it is one of two such plants designed by FP&L engineers to supply quick emergency or auxiliary electric power wherever required in the Company's state-wide system. It has served both storm-damaged areas and thriving new resort communities like Naples, Florida, where seasonal tourist influxes call for sharply increased electric service.

The self-contained plant is designed for continuous operation if necessary and connects with all FP&L power supply facilities. It is equipped with a 1000-horsepower Diesel engine, a 700-kilowatt generator, and Wagner variable-voltage Power Transformers, delivering voltages from 2,300 to 13,200 volts.

Here is further proof that meeting unusual electric requirements comes easily with Wagner. Whatever the problem, Wagner has the *right* answer. Let a skilled Wagner engineer discuss your needs with you. Contact the nearest of our 32 branch offices, or write us direct.



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AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

W754-1

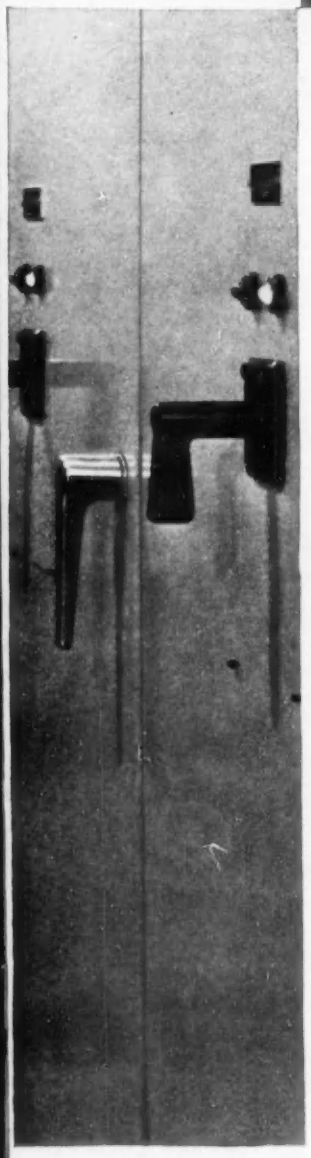
1951 GENERAL ELECTRIC INTRODUCES SELF-X, A NEW FLAME-RETARDANT INSULATION

1954 SELF-X GUARDS OVER 10,000 GENERAL ELECTRIC METAL-CLAD UNITS

G-E METAL-CLAD SWITCHGEAR lineup features Self-X, G.E.'s service-proved flame-retardant insulation, at vital points.

COFFIN AWARD. Nicholas F. Arone, laboratory engineer in G-E Switchgear Product Laboratory, receives Company's highest employee honor—the coveted Coffin Award—from G. E. Burens, General Manager, Switchgear and Control Division, for developing Self-X insulation.

COMPARISON TEST shows why Self-X insulation gives better protection to metal-clad switchgear. In this photograph, taken immediately after both pieces of insulation were withdrawn from the flame, N. F. Arone (at right) holds a piece of ordinary insulation which continues to burn, while the Self-X held by H. F. Hentschel, General Manager—Medium Voltage Switchgear Department, stopped burning as soon as flame was removed. Other tests of Self-X included exposure to electric arc.



Self-X insulation proved by three years of service

Back in 1951, the first sheets of a new type of flame-retardant, self-extinguishing insulation, just developed by General Electric, were installed in a metal-clad switchgear unit.

In severe laboratory tests, the new Self-X insulation proved that it could stand up even under direct flame or an electric arc. As soon as direct flame contact was removed, polyvinylchlorides in the laminated sheets went to work *fast*. Smothering action started—and the fire was put out in less than a minute.

That was over three years ago. Today, this service-tested insulation developed by General Electric Company is acting as a built-in fire extinguisher for over 10,000 switchgear units. Its flame-retardant features make it ideal for bus and cable supports, insulating barriers, between compartments, box carriers for arc chutes—all vital spots.

Self-extinguishing insulation is just one of the advanced safety features of G-E Metal-Clad Switchgear, which helps guard utility and industrial power distribution systems. To learn more about it, call your nearest G-E Apparatus Sales Office or Authorized Agent. Or write for bulletin GEA-5664 to General Electric Company, Schenectady 5, N. Y.

511-4

Progress is our most important product

GENERAL ELECTRIC

PROGRAM HIGHLIGHTS are gone over by M. D. Duffy, vice chairman; A. I. Sawyer, chairman, engineering and operation section; and Berkeley Snow, secretary of the Northwest group

Energy Is Key to Progress

Karrer tells Nelpa engineering meeting savings in energy for space heating and transportation offer opportunities

Energy holds the key to our future welfare and material progress and is vitally linked with the social problems of the world. This statement of L. E. Karrer, executive vice president, Puget Sound Power & Light Co, keynoted the 31st annual general meeting of the engineering and operation section of the Northwest Electric Light and Power Association. Attendance at the meeting, held April 15-17 at Seattle, was 305.

Economics of long-distance transmission, electric house heating, and modern trends in metering were among the top items discussed.

About 50% of all energy consumed in this country can be charged to space heating and transportation, Karrer said. This points the way to areas where substantial savings would have great significance. And there are those who hold that both atomic energy and fossil fuels will finally give way to direct utilization of solar energy. A new method that holds great promise is the dissociation of water into hydrogen and oxygen by exposure to direct sunlight. If cerium and other catalytic agents are placed in water, about 4% (the ultraviolet rays) of all sunlight is utilized in effecting the breakdown. The consequences of commercial development of this process defy the imagination, Karrer concluded.

Economics of transporting energy in the Pacific Northwest, according to C. N. Phillips, Ebasco Services, Inc, point to these conclusions:

1. In the long-range future greater use will be made of steam plants burning coal or lignite.

2. The area will lean toward the greater economies of several large units in central plants.

3. Long-distance electrical transmission cannot be justified unless generating plants are located near the mine mouth. But then supplies of water and long-term, low-cost fuel, and a high load factor are necessary.

4. Justification of electrical transmission vs hauling of coal by rail over long distances will be most difficult, even with mine-mouth plants. The fact that rail carriers may offer lower rates for train-load lots of coal will further put off long-distance electrical transmission.

Dc testing of rotating machine windings has enabled Pacific Gas & Electric Co, reported Leslie Hill, to rewind 12 hydro units since 1949. This test method also has shown that machines do not need preliminary drying out before going on the line. Elimination of dry-out time has saved the company the equivalent steam generating costs of $22,500 per day. In addition PG&E also puts transformers on the line without prior dry-out and with a satisfactory degree of safety. Hill emphasized that a small company having few machines that cannot be taken out of service for very long would find operation of units based on dc testing of insulation even more beneficial.

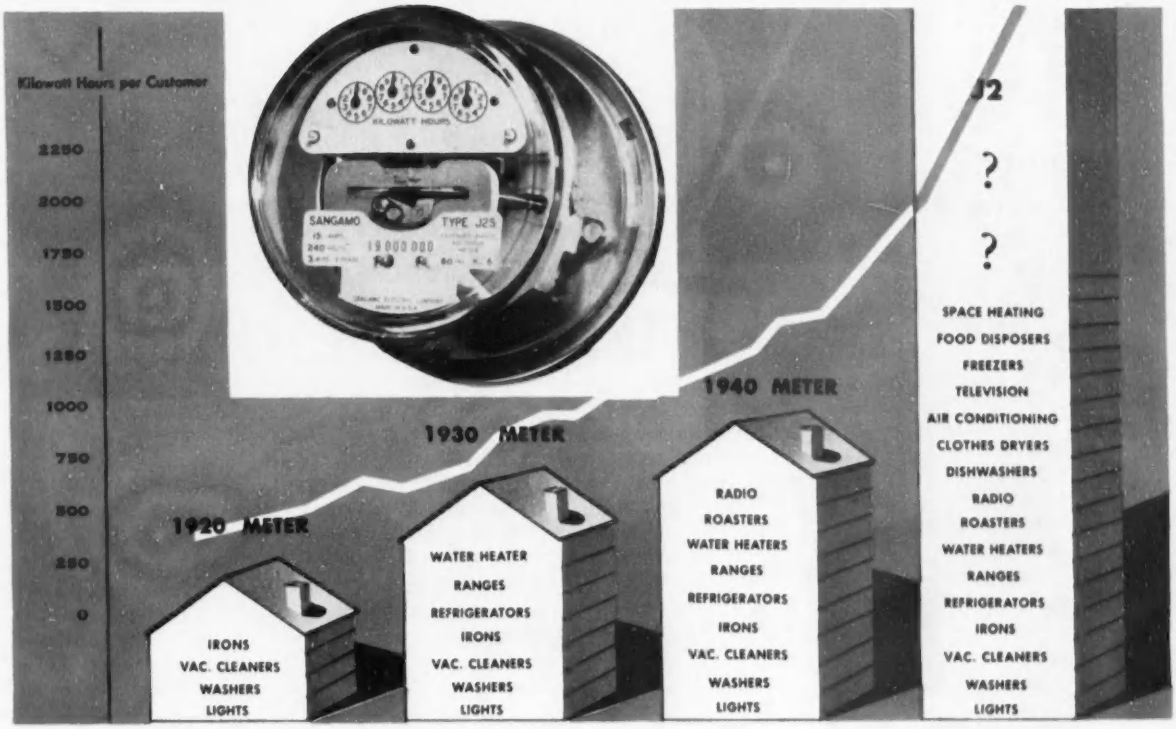
Large Units Have the Bearing Trouble . . . Operating experience of 13 utilities with hydro plants in the Pacific Northwest indicated that main bearing troubles center mainly around the larger units. This was reported by E. L. Bayles, Pacific Power & Light Co. But discussion brought out that size alone is not the only criterion of satisfactory bearing operation. In addition the report showed no general agreement on the practice of jacking hydro units before start-up. Some companies jack some units but not others.

Heating Customers Profitable . . . Based on present estimates of load growth, California Oregon Power Co may have a 25% saturation of electric space heating by 1957, reported L. M. Stinson. Present saturation among 64,429 customers is 15%. During 1953, heating customers on the Oregon part of the system used an average of 20,500 kwhr at a cost of $224 compared with an average of 8,454 kwhr used by non-heating customers at a cost of $122.

Load factors based on average values show the heating customers had a load factor of 17.73% compared with 12.87% for non-heating customers. Electric heating load, excluding other uses in the homes, had an average annual load factor of 24.12%, Stinson reported. Revenue per kw demand was shown to be $1.63 for non-heating customers and $1.70 for heating customers.

Trends in modern metering, according to L. C. Blevins, Westinghouse Electric Co, include still greater use

THE NEW SANGAMO TYPE J2



the watthour meter with EXTENDED RANGE

to measure the nation's growing power load . . .

The immense growth of residential power loads during the past thirty years is only an indication of the load growth of the future. Surveys on today's use of service entrance equipment indicate the electrical industry's awareness of the urgent need for adequate wiring.

Adequate *metering* will be needed, too. Accurate measurement of the loads of the future will require a watthour meter with straight line accuracy up to 100 amperes—a meter capable of handling all forseeable increases in average residential consumption. That's why Sangamo has developed the J2, a meter with reserve capacity fully adequate to meet future load growth.

The new Sangamo J2 will protect your investment in new meters by providing sufficient reserve capacity to meet any contingency of future load growth—sustained accuracy with minimum maintenance during its entire life—at *no increase in cost or price.*

Sangamo presents the new J2 with full confidence that this singlephase watthour meter—the finest in Sangamo history—will prove a much needed advance in meter design.

Get the facts . . . mail the coupon below for your copy of "Protect your Investment in New Meters." It's just off the press, and gives the complete story of the evolution of the Sangamo Type J2 . . . the Meter with reserve capacity for growing loads.

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QUALITY CUTOUTS CUT COSTS OF MAINTENANCE

Actual Field Tests KEARNEY TRIP-O-MATIC CUTOUTS

Kearney No. 5765-10 TRIP-O-MATIC Cutout, 5000 volts, 50 amperes

TEST:

50 Amp., 5 KV TRIP-O-MATIC (Cat. No. 5765-10 interrupting rating 1200 amperes indicating) was subjected to varying fault currents. Voltage was 4835. Power factor 11.94% or X/R=8.94. Current values RMS asymmetrical. Fuse cartridge supplied with specimen was used on each test.

RESULTS:

3220 Amps.	1 cycle	Cleared okay
4750 Amps.	1½ cycle	Cleared okay
4500 Amps.	1 cycle	Cleared okay
4600 Amps.	1 cycle	Cleared okay
4450 Amps.	1½ cycle	Cleared okay

NOTE: 50 ampere type K.S. Fuse Links used in this test

EXTRA SECURITY FOR DISTRIBUTION CIRCUITS AT NO EXTRA COST

15 years of service have demonstrated the high protection at low cost offered by the Kearney TRIP-O-MATIC Cutout. Thousands are daily protecting power company equipment—and profits. Only the best wet process porcelain and field tested bakelite and fibre are used in TRIP-O-MATICS. All contacts are silver plated. Line security costs you less when you safeguard your circuits with Kearney. Ask your Kearney Representative.

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of socket-type meters and a rise in use of the 50-amp extended range meter. Demand metering practice reflects a gain in popularity of the thermal type meter. Use of polyphase meters is rising steadily, and Blevins predicted the socket-type polyphase unit will be even more popular than the single-phase socket type.

Economics of current transformers vs high-current socket meters show a saving of $31 to $65 per customer with up to a 200-amp service when the extended-range, 50-amp, 3-wire, single-phase meter is used. In reporting these data, A. D. Morris, Portland General Electric, said savings up to $91 are possible with the use of high-current socket meters for polyphase service.

Aluminum at 7.8 Kwhr per lb . . . Reviewing trends in aluminum and copper, Edward Casey, Anaconda Wire & Cable Co, said his company is aiming at about 7.8 kwhr per lb of aluminum at its new Columbia Falls reduction plant. Aluminum will continue to be used in greater quantities in all phases of utility operation. Of the 115 lb of conductor needed from the generator to the customer per kva delivered, this will be the trend: 0.5 lb at the generator, 27 lb in transmission, 9 lb in subtransmission, 17.5 lb in the primary, and 15 lb in the secondary for a total of 69 lb of aluminum.

For overhead distribution aluminum will replace copper by 50-75%, Casey said. Furthermore, the trend toward aluminum-sheathed power cable is growing world-wide, with more than 3,500 miles already installed in England and 500 miles in Germany.

Aerial surveying and photogrammetry of proposed transmission routes is of great value in holding down the cost of real estate, reported C. N. Teed, Idaho Power Co. Use of these techniques also has been made on a limited basis in laying out new distribution trunk feeders in urban and suburban areas and in backwater studies of proposed hydroelectric developments. In the latter use, contour maps of sites and backwater areas are produced for a fraction of the cost compared with other methods.

No Taps Can Mean Savings . . . Use of a 7.2-kv transformer without taps on the high side, said E. A. Paine, Portland General Electric, would result in a 10% increase in reactive from existing sources, a 10% decrease in losses, lower costs due to less maintenance and no high-side tap changing, and a 5% reduction in the price. But there was disagreement over whether some systems could operate satisfactorily without a tapped transformer.

C. J. Jones, Idaho Power, reported that his company's experience with 24/14.4-kv distribution shows initial costs to be somewhat more than for 12.4/7.2-kv lines in rural areas. With only 15-kv class insulation on the 24-kv lines, the outage record is no greater than that of lower-voltage lines on the system. Jones said line clearances are given on the Idaho Power system on the strength of supervisory indication of breaker opening. However, under this condition it still is mandatory to apply ground clusters on both sides of the section to be worked.

Slow Relays May Do the Job . . . For transformation ratios of two or greater, autotransformers are more economical than two-winding transformers of the same rating, said Philip Light, General Electric. However, he cautioned that careful consideration be given to all circuit constants and conditions in applying autotransformers. In applying relays to transmission lines of secondary importance, remarked Ray Rader, Puget Sound Power & Light, it is wise to determine if equipment slower than 1-cycle relays will do the job as satisfactorily as faster units. This investigation offers an opportunity to save money and perhaps attain a higher degree of reliable operation.

H. W. Smith, British Columbia Electric Co, said its supervisory installation covering 11 stations costs $169,000 annually for operation and maintenance compared with an estimated $500,000 to cover manual operation. In a current-switched substation capacitor installation, W. D. Smith, Portland General Electric, said the first bank goes on at 55% of feeder peak load and comes off at 45%. A second bank comes on at 65% of peak and is taken off at 60%.

Higher Voltage, Cheaper Light . . . Permissible secondary voltages above 120 v should be sold to the customer as being advantageous, M. F. Hatch, Washington Water Power Co, said. Lamps above 120 v provide more economical illumination and the industry is selling lighting and not lamps, he continued. But Joe Moore, Portland General Electric Co, added that in certain special cases 125-v lamps should be recommended for use by customers who consider longer lamp life more important than greater illumination.

William U. Dent, Westinghouse, pointed out that five additional relay circuits may be made available per channel if relay operators will give up the emergency 6-kc voice channel normally requested and use voice communications systems established for company use. He also said the FCC will look very closely at power line carrier applications above 200 kc because of possible interference with airway beacons.

Water Prospects Good in Most of Columbia Area

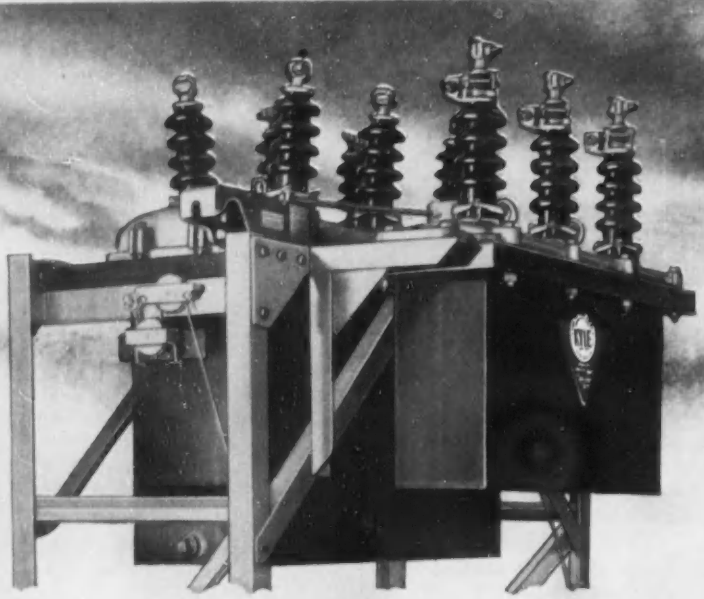
Columbia basin water supplies for irrigation and power during the summer season ahead vary from excellent for most of the Pacific Northwest drainage area to unusually low in the southern edge of the Snake River drainage in Idaho and Oregon.

April 1 snow surveys of the snow pack throughout the entire upper Columbia show well above average water content and some courses—on the Upper Columbia, Kootenai and Bitterroot basins—hold snow water greater for this time of year than has ever been recorded. New snow on the upper reaches of the basin fell after the April 1 surveys added to the record supply and contributes to a flood potential in mid-summer.

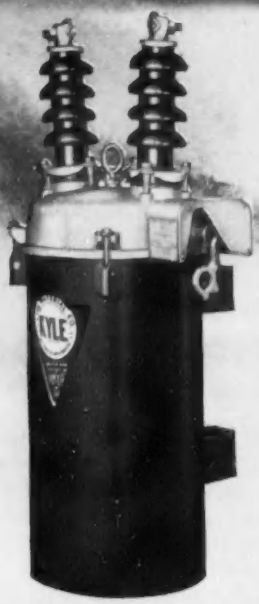
Data was released in a joint statement issued by the U. S. Weather Bureau River Forecast center in Portland and the Soil Conservation Service's Columbia Basin Snow Survey.

The report said, in summary:

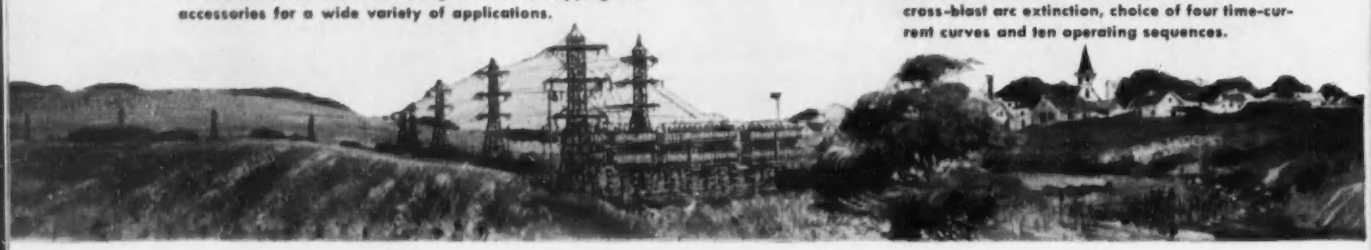
"Present indications, assuming median subsequent precipitation, are that water year runoff in the Upper Columbia will be slightly to substantially greater than the 1942-51 average. Seasonal flows in the Kootenai basin are expected to be near the maximum record. In the Snake basin, water year runoff is forecast to be near average except in the left bank in Idaho and eastern Oregon tributary basins where water year runoff is expected to be near 75% of the 10-year average.



Kyle Type R three-phase recloser; designed for substations up to 100,000 kva symmetrical fault current and heavily loaded feeders. Available with ground fault tripping and accessories for a wide variety of applications.



Kyle Type L single-phase heavy-duty recloser; provides interrupting capacities up to 6000 amperes at 4.8 kv, 4000 at 14.4. A big recloser with oil cross-blast arc extinction, choice of four time-current curves and ten operating sequences.



Complete Coordinated Automatic Protection from Substation to Load

Distribution Class Nominal Rating 14.4 kv BIL 95 kv			Intermediate Duty Nominal Rating 23 kv BIL 150				Heavy-Duty Nominal Rating 14.4 kv BIL 110 kv			
Single-Phase Type H Three-Phase Type 3H			Single-Phase Type E Three-Phase +				Single-Phase Type L Three-Phase Type R			
Rating Amps.	Min. Trip Amps.	Inter. Rating* 14.4 kv	Rating Amps.	Min. Trip Amps.	Inter. Ratings* RMS Amperes 14.4 kv	23 kv	Rating Amps.	Min. Trip Amps.	Inter. Ratings* RMS Amperes 4.8 kv	14.4 kv
5	10	125	5	10	200	125	....	....	....	....
10	20	250	10	20	400	250	....	....	....	....
15	30	375	15	30	600	375	....	....	....	....
25	50	625	25	50	1000	625	25	50	1500	1500
35	70	875	35	70	1400	875	35	70	2100	2100
50	100	1250	50	100	2000	1250	50	100	3000	3000
....	....	....	70	140	2500	1750	70	140	4200	4000
....	....	....	100	200	2500	1750	100	200	6000	4000
....	....	....	....	....	....	....	140	280	6000	4000
....	....	....	....	....	....	....	#160	320	6000	4000
....	....	....	....	....	....	....	#185	370	6000	4000
....	....	....	....	....	....	....	**200	400	6000	4000
....	....	....	....	....	....	....	#225	450	6000	4000
....	....	....	....	....	....	....	#280	560	6000	4000

*Recloser interrupting ratings are based on the maximum test circuit X/R ratio of not less than 8, and the asymmetrical rating in total RMS amperes is 1.4 times the symmetrical ratings given in the table.

#Available in three-phase Type R only. **Available in single-phase Type L only.

+Electrical interconnection available to give three-phase lockout.

For Ground Fault Tripping: Type R heavy-duty three-phase recloser is available with built-in ground trip solenoid and auxiliary current transformer. Type 3H is available with a shunt lockout coil which may be used for ground fault tripping with suitable auxiliary equipment.

Get the Facts on Complete Coordinated Automatic Protection

The L-M Field Engineer can help you with your protection problems. Discuss them with him—you'll find his advice helpful. Or write for information and bulletins. Kyle Products Division, Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

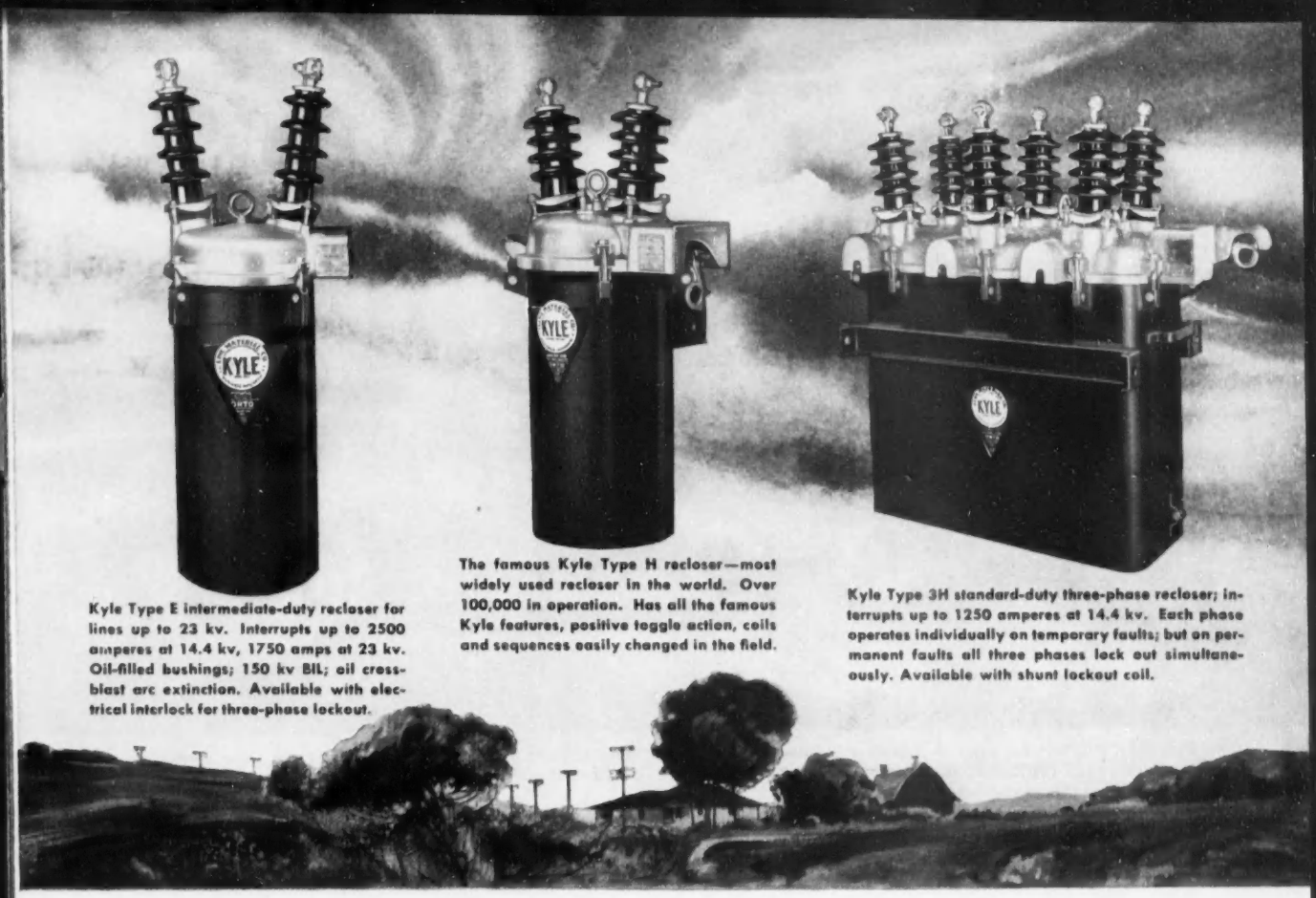
181

Compare What L-M Offers

Note the complete range of protection L-M offers in Kyle reclosers, compared with that offered by other companies.

SINGLE-PHASE						
Duty	L-M	Co. A	Co. B	Co. C	Co. D	Co. E
Light	yes	no	yes	yes	yes	no
Intermediate	yes	no	yes	yes	no	yes
Heavy	yes	no	no	no	no	no
23 kv	yes	no	no	no	no	no
Sectionalizer	yes	no	yes	no	yes	no

THREE-PHASE						
Light	yes	yes	no	yes	yes	no
Intermediate	yes	yes	yes	yes	no	no
Heavy	yes	no	no	no	no	no
23 kv	yes	no	no	no	no	no



Kyle Type E intermediate-duty recloser for lines up to 23 kv. Interrupts up to 2500 amperes at 14.4 kv, 1750 amps at 23 kv. Oil-filled bushings; 150 kv BIL; oil cross-blast arc extinction. Available with electrical interlock for three-phase lockout.

The famous Kyle Type H recloser—most widely used recloser in the world. Over 100,000 in operation. Has all the famous Kyle features, positive toggle action, coils and sequences easily changed in the field.

Kyle Type 3H standard-duty three-phase recloser; interrupts up to 1250 amperes at 14.4 kv. Each phase operates individually on temporary faults; but on permanent faults all three phases lock out simultaneously. Available with shunt lockout coil.

Only L-M Offers Complete Coordinated Protection from Substation to Load

by **R. C. KIRK**
Manager
Kyle Products Sales
Line Material Company

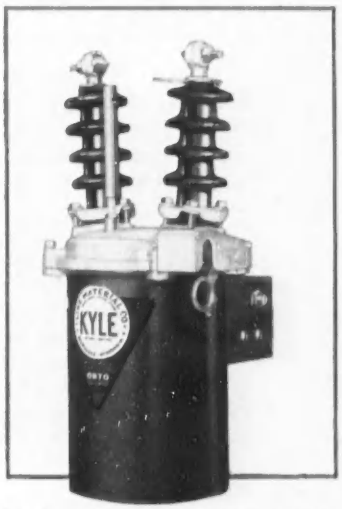
Utilities have done an outstanding job of rendering continuity of service to their customers, many times under extremely adverse conditions. But the growing cost of service continuity is a serious problem for the distribution engineer.

To help alleviate this problem, L-M makes available a complete, coordinated system of automatic protection. Reclosers are available that meet widely varying requirements, from those of a good-sized substation and heavily loaded feeders down to the smallest section. Automatic sectionalizers coordinated with the reclosers help eliminate faults, or will cut off one section without interrupting service on an entire area.

Complete automatic protection eliminates from 50 to 95% of the outages, utility experience shows. Service trips for replacing fuses are greatly reduced. Revenue is increased and costs can be cut appreciably.

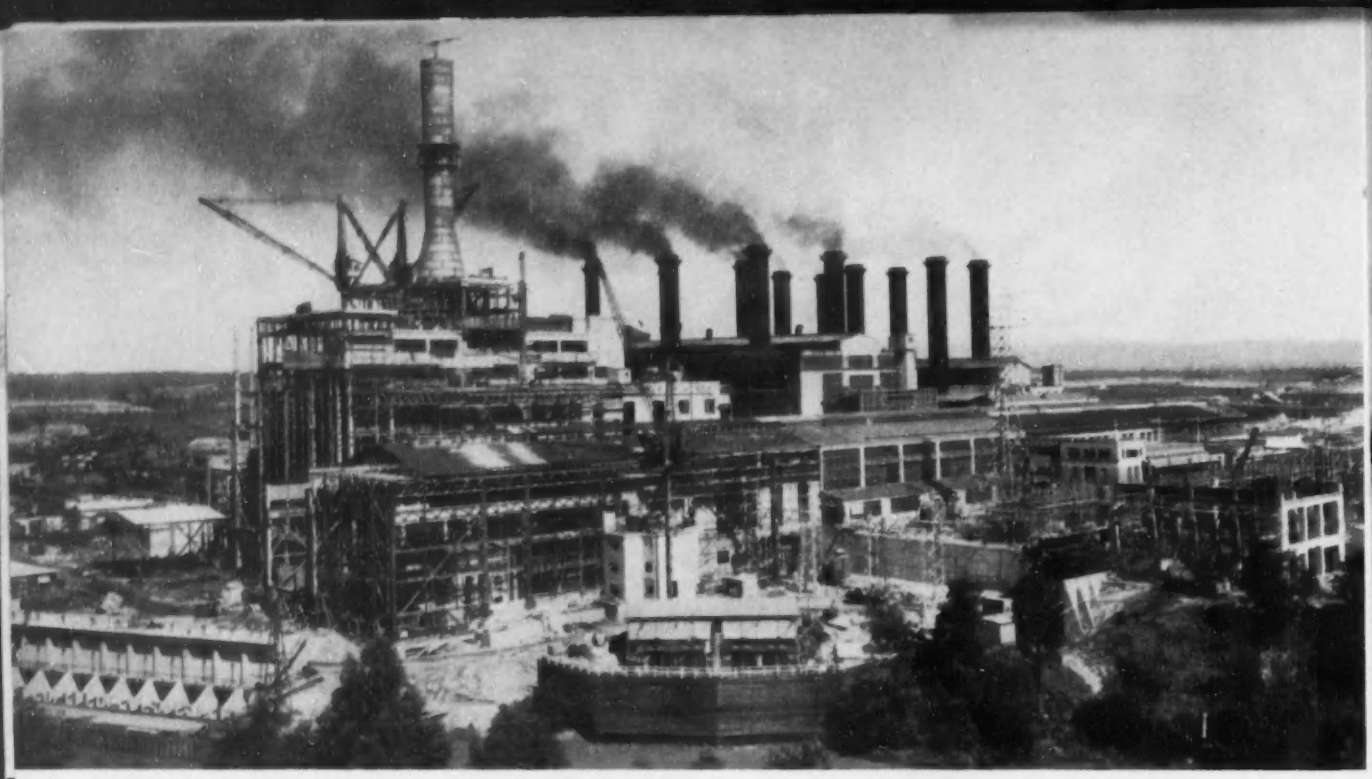
L-M was a leader in developing the completely automatic, dependable hydraulic timing system. L-M introduced dual timing in Kyle reclosers; L-M has pioneered in recloser development and has been the leader in the number of reclosers in use. Kyle reclosers offer the widest choice of time-current curves and operating sequences. And only L-M offers the fully coordinated series of reclosers and sectionalizers that permits complete automatic protection.

The design of Kyle reclosers and sectionalizers has been thoroughly tested and fully proved by extensive field experience. Because L-M makes more reclosers than any other company, L-M engineers have more experience, more data on which to provide Kyle Recloser Application Service. 181



Kyle Type GS sectionalizer; coordinates with reclosers to clear temporary faults on branch lines. If faults are permanent, sectionalizer locks out, permits the recloser to restore service on other lines.

LINE MATERIAL Kyle® Reclosers



BROWN COAL fires the boiler of expanding Yellourn Power Station in Victoria. Two 100,000-kw units, the first of which is shown, are being added to bring its capacity to 375,000 kw. Near a huge open cut, thermal station burns brown coal with moisture content of 67%

New Zealand:

Steam, Out of the Mouths of Caves

AUCKLAND, (McGraw-Hill World News)—New Zealand has two major shortages right now in the power field: cash and kilowatts. Government and Opposition both are agreed power expansion should be pressed to the hilt. But power capacity is costly, especially when it almost has to be hydro.

There is one alternative for the islanders, though, that gives promise of providing a 50% increase in present capacity at one-twelfth the cost of installing hydroturbines. The alternative is geothermal steam.

The area around Wairakei on North Island abounds in it. The possibility is being explored for all it is worth by New Zealand engineers. Pressures and volumes of steam found in some of the deeper bores already have changed engineers' concept of the kind of pilot plant they intend to build. Originally they estimated the capacity would have to be around 20,000 kw; now they plan for one of about 60,000 kw.

The Potential . . . Experts disagree on total potential for the area, but figures often quoted are 100,000 kw for the Wairakei Valley and up to 400,000 kw for the whole thermal belt. Big obstacle to be surmounted before a geothermal plant comes on the line is corrosion. A special study is being made to overcome it. Once that is licked, engineers are confident they'll be able to bring in the power.

Meanwhile, the government is pushing development along the more conventional hydro lines. The country is short of foreign exchange needed to pay contractors and purchase equipment. But the islanders are determined,

DOWN UNDER

Australia:

Power, A Lighter Shade of Black

MELBOURNE (McGraw-Hill World News)—The forthcoming Down Under winter promises to be a bright one for Australia. For the first time in many years, power will be in sufficient supply over most of the continent, so that rationing and brownouts will not be necessary.

Power plants coming on the line during the fall season now in progress give promise of meeting estimated demand, though in some places reserve margin will be slender. Deficits of a number of power agencies are growing smaller and in several places users will begin to benefit from cheaper rates.

With the end of rationing, demand for appliances and thus for power is expected to rise rapidly. This, plus a rising demand for industrial energy, has given power officials qualms about the future, and set them planning feverishly to overcome financial and technical obstacles in the path toward greater expansion. As it looks now, the fight for more power will be successful, although it is doubtful that goals will be reached on schedule.

No Abundance . . . Australia's natural power resources seem adequate to the needs of the immediate future, but are not impressively large. This at least was the opinion of experts until large deposits of uranium were discovered recently. Now research into power from atomic energy is being pushed in the hope it may open up vast new supplies of energy.

Annual electricity consumption in the metropolitan areas has increased by 150% in comparison with prewar consumption. Experts calculate an adequate supply would have resulted in an increase of three times the prewar consumption for these areas. Before the war Australia could hardly be called an industrialized country but today the industrial demand for power accounts for the biggest slice of consumed electrical power with domestic consumption second.

In 1932-33 total electricity generated in Australia was only 225 mil-

THAR SHE BLOWS! Welldiggers duck as test bore in Wairakei geothermal field is holed through. Steam will be harnessed to make power

and have decided to borrow abroad so some of the bigger projects may be pushed to completion quickly.

Most of New Zealand's electric power (about 93%) is generated by water. Fuel plants are few and maintained mostly to meet peak demand or for standby purposes. The major portion of the generation is undertaken by government plants and even under the present private enterprise government there seems to be no tendency for encouraging private generation on a larger scale.

Wartime lag in expansion and postwar difficulties in securing capital, labor and equipment have resulted in shortages, rationing and supply restrictions in many regions of New Zealand. More recently, some additional plants, notably the Maraetai Station, have enabled an improvement in supply. Still it is generally acknowledged that the problem is urgent. Despite difficulties, New Zealand power supply last year was more than 2½ times that of 1939.

The Program . . . Power development in New Zealand now stands at 95 plants, 700,000 kw and nearly 600,000 customers. Government hydroelectric stations now total 15. When construction is completed on some of these stations, the ultimate installed capacity will be 1,121,960 kw. Last

MELBOURNE will get power from 62,000-kw Kiewa Hydro Plant in Australian Alps. Generator room, above, is 450 ft underground

Australia (continued)

lion kwhr. The last year before World War II, the total still was only 391 million kwhr. Since then each year has meant another record for total electricity generated, until last year the total stood at 1,024 billion kwhr.

In addition to normal expansion, the federal government has initiated the Snowy Mountains Hydroelectric Project in cooperation with the New South Wales and Victoria Governments. Emphasis here is on long-range development of a number of power stations which ultimately will attain very great capacity.

The Snowy Scheme may some day alter the proportion of thermal to hydro generation considerably. Today, about 80% of Australia's generating capacity is steam, 15% is hydro and 5% is internal combustion.

Australia's effective generator capacity is much lower than that of the United States, or even that of the United Kingdom. But it is higher than in any Asian country except Japan. The country has an extremely high degree of interconnection and centralization. There are about 375 power stations in Australia. Most are federal, or local-government owned and operated. Trend continues to be away from private development.

To proceed with its electrification work at a time of shortage of funds, some power agencies have offered new connections to those lending money to the agency. The scheme has generally been successful.

Australia realizes that her increasing industry and big plans for the future will demand a much greater supply of power. When present projects are completed (with the exception of the big Snowy Project), Australia's total generating capacity should be in the vicinity of 3.7 million kw. Out of this about 3 million will come from steam resources and .5 million from hydro.

Ambitious expansion plans provide for something like 5.5 million-kw capacity about 1960 but shortages of funds may mean goal will not be attained.

New Zealand (continued)

ONE OF THREE major hydro developments under construction in New Zealand is Whakamaru Power Project on the Waikato River, above

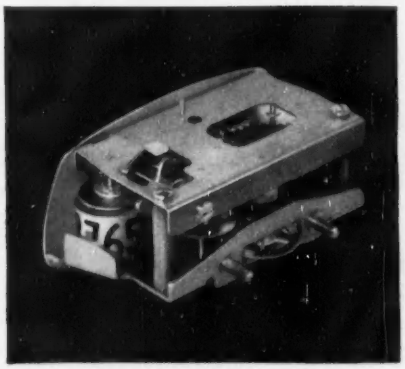
year work was under way on three major new projects (Maraetai, Whakamaru and Roxburgh), on two major extension works (Cobb and Waitaki), three lake-control works (Pukaki, Tekapo and Waikaremoana) and 13 substations. Investigations and preliminary work were reported on at least a dozen other projects.

New Zealand looks forward to better currency conditions which would enable the country to take the best-suited contractor and to purchase equipment in the best source of supply. Most consultant work is being done in England but big equipment is frequently purchased in the United States and Canada. Japanese interests are now actively trying to secure markets in New Zealand for their power equipment.

In the next few years, present rate of expenditure on power expansion at least will be maintained. With one or two exceptions, all money will be spent on hydroelectric stations along the lines of present-day construction. No revolutionary changes are expected in any of the projects now under discussion.

The demand for power is increasing but transmission problems in a country like New Zealand are frequently very difficult. On the other hand, New Zealand realizes that its increased industrial production will depend on increased power availability. This explains why high priority is being accorded to power development.

Westinghouse Cyclometer Register Easier to Read



Precision workmanship and sturdy construction identify the Westinghouse cyclometer register for CS and CA meters.

Larger numerals on a permanent white background give this improved Westinghouse cyclometer register far superior readability. Partially obscured figures have been eliminated by providing for "jump" advance of all four drums.

The cyclometer register shown can be supplied on all Type CS and CA meters and is interchangeable with all registers previously used on these meters. The register resets quickly and easily. All gears are precision milled for accuracy . . . and gold finished for corrosion protection.

Your Westinghouse representative has additional information on the new cyclometer register. Ask him for a copy of B-5846-A or write Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-40478

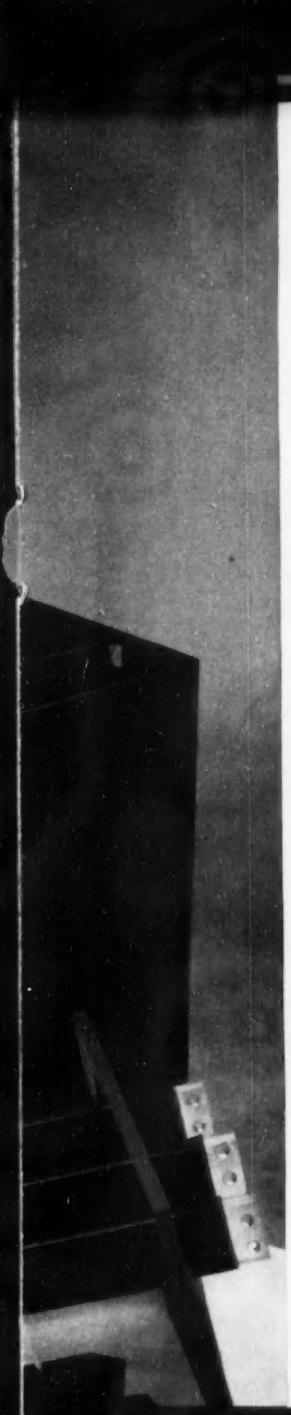
YOU CAN BE SURE...IF IT'S

Westinghouse

Laboratory tests, supervised by Dr. Leonard E. Edelman, Westinghouse Research Engineer, prove conclusively the self-extinguishing and the greater fire-resistance characteristics of REDARTA.

Shortly after 55-ampere current was sent through the nichrome heater, the comparative insulation sample (left) had burst into flame. REDARTA (right), though charred from the extreme heat, had not yet begun to burn.

In nearly twice this length of time, REDARTA finally ignited. This unusually slow ignition time is the measure of the extra protection REDARTA gives you in Westinghouse metal-clad switchgear.



WESTINGHOUSE REDARTA INSULATION

New protection standard for metal-clad switchgear

REDARTA is the newest—and greatest—name in switchgear insulation. This entirely new Westinghouse insulation is superior in every way—*including flame-retarding ability*—to any fibrous insulation ever developed. And, because it is available in every shape and form, it is used *throughout* in Westinghouse metal-clad switchgear—not in just a few vital places—assuring you far greater over-all protection.

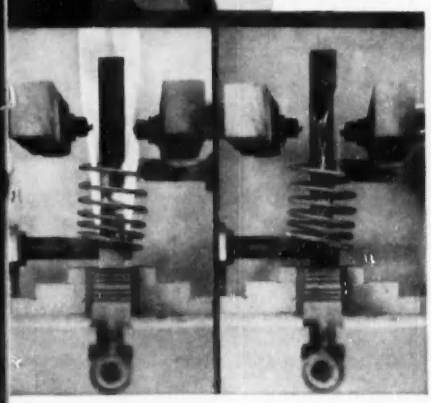
REDARTA's Greater Fire Resistance has been proved conclusively in laboratory tests (see below). When exposed to arcing caused by high ampere currents, REDARTA is slower to ignite—will stop burning quicker when arcing ceases. The fire extinguishing ingredients in the insulation release a gas that quickly retards the flames—prevents the fire from spreading to adjacent compartments.

REDARTA's All-Around Superiority was deliberate—the result of over 5 years of painstaking work by Westinghouse research engineers to improve *in every respect* the high-quality insulation then in use. How well they succeeded is shown in the comparative table below.

Superior protection is just one of many reasons why you should consider Westinghouse metal-clad switchgear. Others: Superior design and manufacturing, greater service continuity, greater safety and convenience, lower operation and maintenance costs, longer life. Get the complete story today from your Westinghouse representative or write Westinghouse Electric Corp., 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa. J-60863

YOU CAN BE **SURE**...IF IT'S

Westinghouse



REDARTA stopped burning quickly after the current was turned off—the comparative sample burned until consumed. By extinguishing its own flame, REDARTA helps control fires.

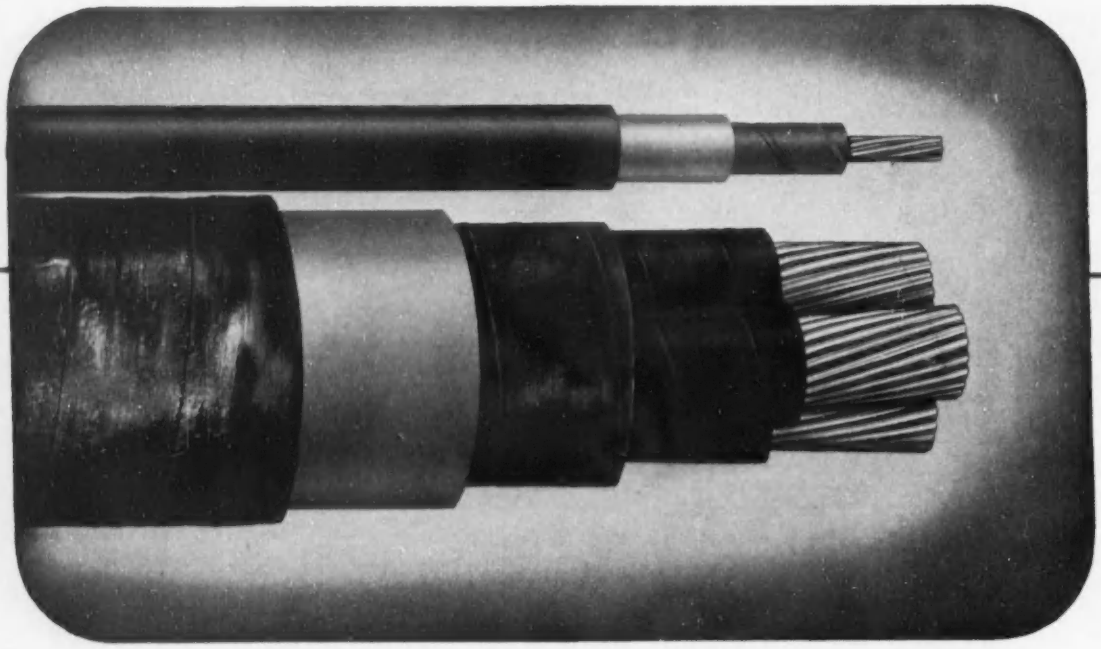
CHARACTERISTICS	INSULATION A*	INSULATION B**	WESTINGHOUSE REDARTA
Tensile strength (psi)	12,000	10,000	22,800
Flexural strength (psi)	15,000	15,000	28,050
Compressive strength (psi)	36,000	32,000	51,320
Izod impact strength FW	1.4	1.3	2.2
(foot lbs./inch width) EW	0.5	0.5	0.687
Moisture absorption (% increase in wt. 24 hr. room temp.)	0.40	1.5	0.93
Dielectric strength (short time volts/mill 1/8" thick)	700	500	840
Power factor 60-cycle (1/4" thick)	7% max.	10% max.	4% max.

*Electrical grade laminate NEMA XXX.
**Development sample of electrical grade insulation treated with polyvinylchloride.

Comparative characteristics tell the story of REDARTA's all-around superiority. This table shows that in practically every characteristic vital to insulation performance, REDARTA is better than all other known insulations.

ROEBLING PROTECTIVE COVERINGS ON LEAD SHEATHED CABLE

for utilities, chemical plants and the petroleum industry



LEAD SHEATHED CABLES used in certain applications by public and private utilities, chemical plants and the petroleum industry are often impaired by electrolysis or chemical corrosion. But such corrosive action can be effectively reduced, and cable life extended, by using Roebling Paper Insulated and Varnished Cambric Cables with either of two outer protective coverings.

One of these coverings is an extruded thermoplastic sheath employing a special high-molecular weight polyethylene. The other is ROESHEATH, built up of neoprene and neoprene-filled fabric tapes and vulcanized directly over the lead sheath. Both coverings not only provide essential protection, but, in some cases, may permit the thickness of the lead sheath to be reduced.

For longer, more dependable cable life and worthwhile economy write for full information... and get our recommendations for solving any special problem.

John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

A subsidiary of The Colorado Fuel and Iron Corporation

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ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 515 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE S. • ST. LOUIS, 3001 DELMAR BLVD. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, NEW JERSEY

CF&I

JR

E. E. WILLIAMS

DAVID NABOW

Duke Power Names 4 VP's

Williams, Nabow, Lake, and Lucas are promoted to executive posts. Utility also makes engineering, district changes

Duke Power Co has announced the appointment of four new vice presidents, and key engineering and district managerial changes.

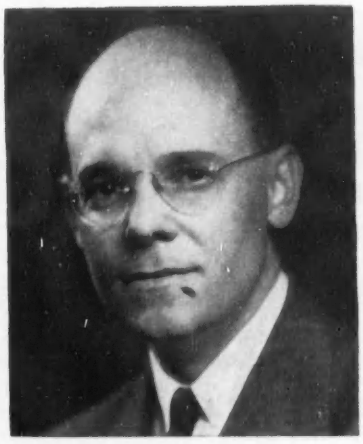
The newly elected vice presidents are: E. E. Williams, superintendent of the Steam Division; David Nabow, chief engineer; Marshall E. Lake, manager of mill power department; and John Paul Lucas, Jr, director of advertising and public relations.

Other changes call for H. W. Oetinger, engineer with the company since 1927, to assume the position of executive assistant. C. T. Wanzer, construction engineer since 1918, was made construction manager and H. B. Wolf, who has served in a number of departments since joining the utility in 1916, was named manager of operations.

District Managerial Changes . . . Charles B. Miller, Jr, Winston-Salem district manager, was promoted to assistant branch supervisor for the Duke system with headquarters in the company's general offices in Charlotte, N. C. Miller is succeeded in the manager's post by D. W. Jones, manager of the utility's Anderson district.

W. G. Wiatt, branch manager at Marion, takes over Jones' job at Anderson. Keith Arledge, engineer at the Hendersonville branch, was appointed manager at Marion to replace Wiatt.

MARSHALL E. LAKE



JOHN PAUL LUCAS, JR

Key Divisional Changes Announced by West Penn

Personnel changes involving three division managers and several headquarters executives have been announced by West Penn Power Co.

G. B. Hoffman, Keystone Division manager with headquarters at Ridgway, was made assistant chief engineer at the utility's Pittsburgh general office. D. T. Faust, Central Division manager at Charleroi, was appointed Keystone Division manager to replace Hoffman.

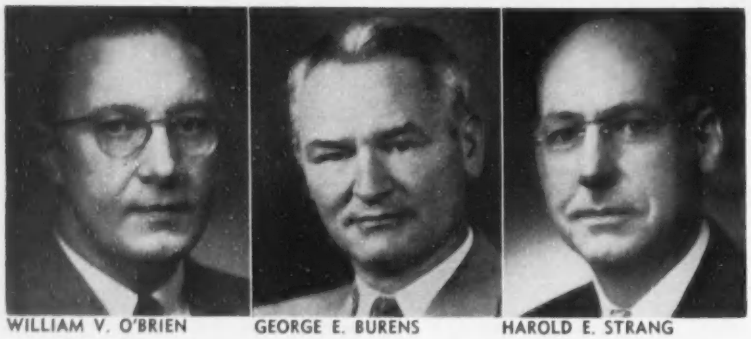
J. V. Soisson, assistant vice president at Pittsburgh, returns to Charleroi as division manager, where he will head an eventual combination of the company's Central and Western Divisions.

Ralph C. Dewey, division operating superintendent at Charleroi, was promoted to the newly created headquarters post of supervisor of maintenance standards. In this position, he and his new department will supervise lines and substation construction and maintenance for West Penn.

C. F. Sheakley, manager of lines at Pittsburgh, takes over the position of special assistant to the personnel director. J. B. Marburger was elevated to supervisor of taxes at Pittsburgh. W. L. Wagner is now supervisor of machine services for the company at Pittsburgh.

Heads California PUC

Peter E. Mitchell has been elected president of the California Public Utilities Commission. A member of the commission since 1951, Mitchell succeeds Richard E. Mittelstaedt, who retired May 1 after eight years with the PUC, having reached the statutory age limit of 70. Prior to his appointment to the PUC, Mitchell was a member of the California Employment Commission and its Unemployment Appeals Board.



WILLIAM V. O'BRIEN GEORGE E. BURENS HAROLD E. STRANG

General Electric's New Vice Presidents

General Electric Co has elected three of its executives as vice presidents. They are: William V. O'Brien, general manager of the Apparatus Sales Division; George E. Burens, general manager of the Switchgear and Control Division; and Harold E. Strang, general manager of the Measurements and Industrial Products Division.

O'Brien, whose headquarters are in New York, became associated with GE in 1922. Since 1951 he has been serving as a general manager, a position he will continue to fill. Burens, who joined GE in 1921, assumed the Switchgear post at Philadelphia in 1951 and will continue to serve in that capacity. Strang, an electrical engineer, began his career with GE in 1922, assuming the present post at Lynn, Mass., in 1951.

PERSONAL BRIEFS

Charles Larsen, superintendent of the Lakeland (Fla.) Light & Water Department, has been voted by Lakeland City Commissioners as consulting engineer for the $3.5 million expansion at the Lake Parker power plant.

Frank Sleeter, director of plant facilities for Radio Corp of America, has been elected vice president of facilities administration. He joined RCA in 1946.

Charles E. Erb, Russell E. Ebersole, and **Herbert E. Plishker** have been advanced by Westinghouse Electric Corp's Lamp Division, Bloomfield, N. J. Erb, who began his sales career in 1933, was named general sales manager. Ebersole was made marketing manager and Plishker merchandise manager. Ebersole joined Westinghouse in 1922 and Plishker in 1927.

OBITUARY

Nicholas de Jureneve, 49, comptroller of American & Foreign Power Co and vice president and director of Ebasco International Corp, died in New York April 29. He was engaged in a banking career before joining American & Foreign in 1945. He was also an officer and director of a number of Latin-American subsidiary and affiliated companies of the latter organization. Born in Russia, de Jureneve came to this country in 1924, obtaining a degree from Dartmouth College two years later.

William Gordon Woolfolk, 77, retired utility executive of Detroit, died last month at Tucson, Ariz., while on vacation there. Woolfolk was named president of United Light & Railways Co in 1939, becoming board chairman six years later. He retired from that post in 1949. Prior to this he was president and board chairman of Michigan Consolidated Gas Co. He also was a former board chairman of American Natural Gas Co.

S. I. LINDELL C. C. MARTIN A. B. CHILCOAT L. M. THOMPSON

S&C Electric Co Appoints 4 to Executive Posts

S&C Electric Co, Chicago, has appointed the following men to fill four newly created vice presidencies: S. I. Lindell, C. C. Martin, A. B. Chilcoat, and L. M. Thompson.

Lindell, who began with S&C in 1925, was serving as chief engineer until he was made vice president of engineering. Martin, vice president of manufacturing, joined the firm in 1948, advancing to manufacturing manager.

Chilcoat, vice president of materiel, came to S&C in 1945 after working with General Motors Corp. He served most recently with S&C as production and purchasing manager. Thompson, with the company since 1945, was made vice president-comptroller.

a modern version of an old standby — DELTA-STAR'S

New "PMK"

115 KV 1200 Ampere "PMK-23" Air Switch

"PMK" 600 Ampere Contact Assembly

Here is an old friend you have long been familiar with for substation and pole-top application. It now incorporates all the modern, trouble-free features which have proved so successful on other DELTA-STAR Switches.

Large, hard drawn copper contact shoes, with oval shaped silver inlays, operate against the hard drawn copper tubular blade to form a high pressure small area contact—assuring superior electrical and thermal characteristics.

Years of wear on the contacts and blade will cause no appreciable reduction in contact pressure because of the long multiple leaf pressure applying springs of fatigue resistant beryllium copper. These springs do not function as current carrying members.

Offset arrangement of contacts combined with the blade motion develops a twisting shear, easily breaking formations of ice and corrosion.

These features **plus** all the well-known standard features demanded by engineers, a minimum number of insulators per single pole element, one contact, tubular blades, free swinging bronze ball bearing terminals, minimum side and overhead clearance, and simple mechanism.

Available in "PMK-22" the two bearing type and "PMK-23" the three bearing type, for upright or inverted mounting in all standard voltage ratings from 7.5 to 161 kv at 400, 600 and 1200 amperes.

WHEN YOU WANT THE BEST IN HIGH VOLTAGE SWITCHING EQUIPMENT SPECIFY DELTA-STAR

DELTA-STAR ELECTRIC DIVISION

H. K. PORTER COMPANY, INC.
OF PITTSBURGH
2437 FULTON STREET, CHICAGO 12, ILLINOIS
DISTRICT OFFICES IN PRINCIPAL CITIES

NORTH—Shakopee, Minnesota praised the performance of its Form 206 luminaires. The new lights provide superior illumination even in sub-zero weather.

EAST—Central Maine Power Co. accomplished their working objective of providing better street lighting economically by installing Form 206 fluorescent lights at Auburn, Maine.

NEW G-E FLUORESCENT STREET LIGHTS GAIN NATIONWIDE ACCEPTANCE

Are fluorescent street lights practical? Utility and municipal officials who have installed G-E Form 206 fluorescent luminaires are best qualified to give the answer. Their actual field experience, in all parts of the country, is summarized in the following questions and answers.

WHY USE FLUORESCENT STREET LIGHTING?

Fluorescent street lighting provides better visibility and a more even light distribution than the best engineered systems of either filament or mercury lamps. The low brightness of the light source reduces the glare and eye strain that accompanies other types of street lighting.

IS VISIBILITY IMPROVED?

Yes. Many lighting experts believe that fluorescent street lighting increases actual visibility by about one-third. Thus, a 1.25 footcandle level from a Form 206 fluorescent luminaire seems to provide the same visibility as a 1.7 footcandle level from filament or mercury luminaires.

IS THE COLOR OF THE LIGHT PLEASANT?

Yes. The whiter light furnished by the fluorescent lamps does not distort the familiar coloring of objects and people. Businessmen find that shoppers even come from outside usual trading areas to shop under the comfortable light from the fluorescent luminaires.

IS THE SIZE OF THE LUMINAIRE A PROBLEM?

No. The Form 206 luminaire is only slightly over six feet long and the distinctive size and shape add functional beauty to the appearance of any street or roadway. No guys or trusses are required to support the luminaire even in high winds.

WHAT MAINTENANCE IS REQUIRED?

Maintenance is reduced! The fluorescent lamps used in the Form 206 have an average lamp life of 7500 hours, or about two years of street-lighting operation. The hinged plastic globe is shatterproof and is tightly sealed to prevent dirt or insects entering the unit. Sun, rain, heat, cold, or aging do not adversely affect the plastic globe or the light output.

HOW DO COSTS COMPARE?

When over-all lighting costs are computed on an equivalent visibility basis, G-E Form 206 fluorescent luminaires cost less than any other comparable system of filament or color-improved mercury. Although equipment and amortization costs are somewhat higher, installation costs are comparable, and operating costs are generally lower.

GET MORE INFORMATION about this outstanding G-E fluorescent luminaire, the Form 206. Contact your nearest G-E Apparatus Sales Office, or write Section 452-139, General Electric Company, Schenectady 5, N. Y.

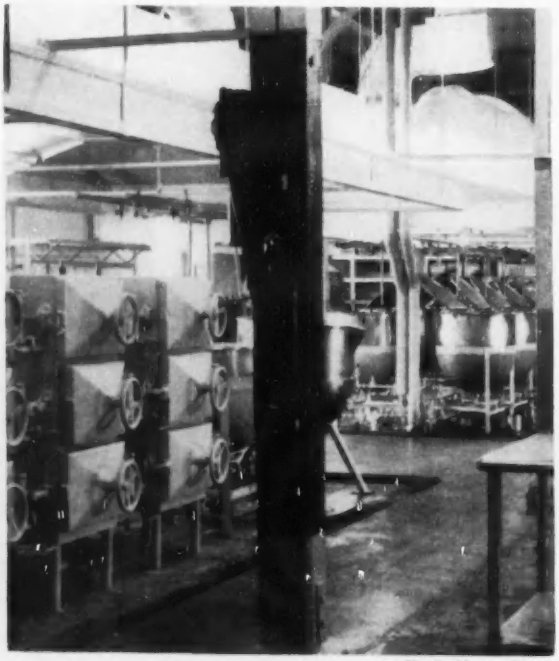
SOUTH—Statesville, North Carolina installed 104 Form 206 fluorescent street lights and was enthusiastic about their visual comfort, economy, and modern appearance.

WEST—Virtually glareless illumination and an even light pattern resulted when Seattle installed Form 206 luminaires to light the second level of this new Alaskan Way viaduct.

GENERAL ELECTRIC

Pork chops, piping hot from electric griddles, help keep up morale of Wave recruits . . .

Inspection—The oven had better be clean



U. S. Navy Photo

Vegetable steamers and steam kettles

Navy's Big Kitchen Has 7.6-Mw Load

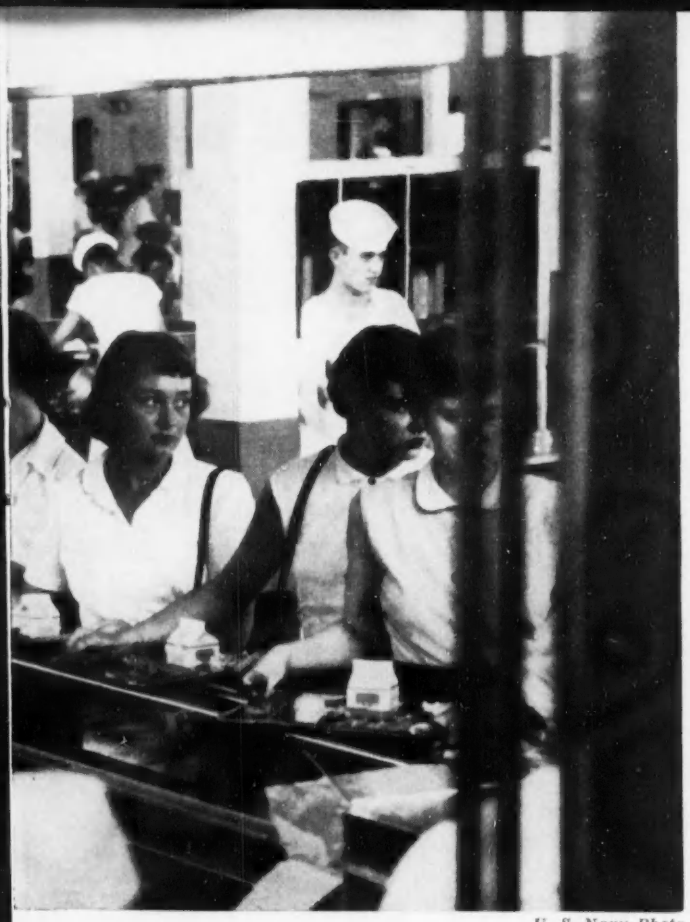
G. T. HIBLER, Conowingo Power Co, Elkton, Md.

Navy personnel at the Naval Training Center, Bainbridge, Md., are being fed from the world's largest electric cooking installation. Over 600 pieces of cooking equipment with a total load of 7,638 kw are in use. The equipment is divided among a number of kitchens including some in the 1,200-bed naval hospital.

Approximately 35,000 persons can be served at one time. Sufficient equipment is available to turn out 108,000 meals per day or almost 3.25 million per month. Best of all, electric cooking has greatly reduced the time spent by personnel in "chow lines." Formerly 8 to 9 persons could be served a minute, now the average is 12 to 16.

Steaks, chops, hot cakes, and other grilled foods are served directly from thermostatically controlled griddles at the cafeteria counters. In the kitchens are batteries of heavier cooking equipment, such as 14 revolving tray ovens, each capable of roasting 3,000 lb of meat at a time. There are also electric fryers, broilers, urns, toasters, coffee makers, food warmers, food carts, and counter fryers.

The Commissary Department planned the modernization of the kitchens with the aid of Conowingo Power Co, a Philadelphia Electric Co subsidiary, which serves the area.



U. S. Navy Photo

who have healthy, hearty appetites

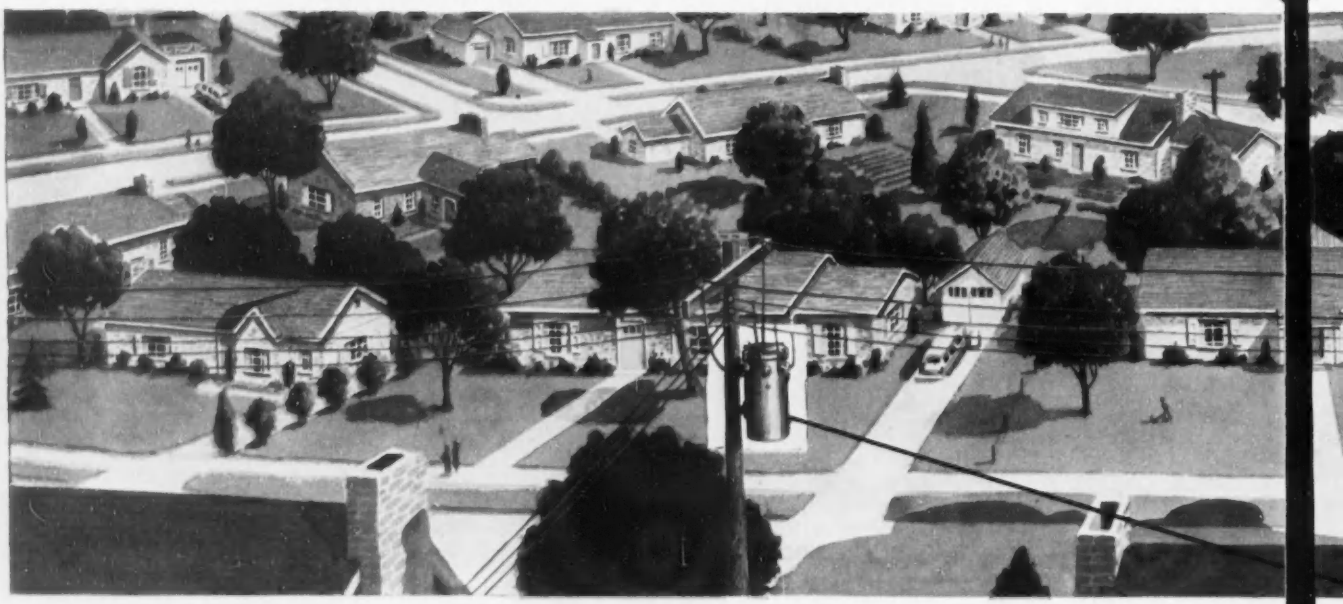
Fryers enough to handle food for 5,000 men

Electric Cooking Equipment

No.	*Appliance*
127	Griddle—Hot-top ranges
130	3 ft Temperature-controlled griddles
103	60-90 lb Fryers
101	Conveyor-type toasters
9	Ad-a-deck ovens
16	48-60-pan revolving tray ovens
5	Heavy-duty broilers
70	Hotplates and coffeemakers
88	Misc—Food warmers, food carts, counter fryers, etc.
649	Total Units

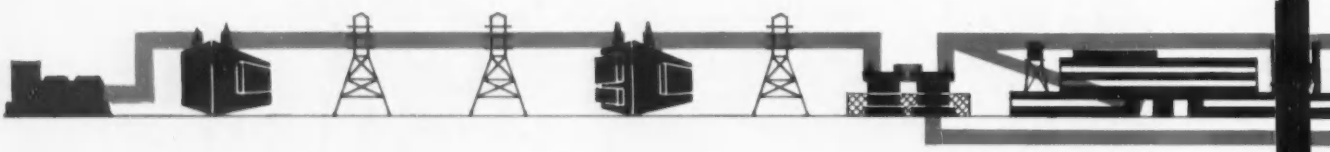
MOLONEY . . . ALL ALONG

For years the name Moloney on a transformer has meant a better product. As utilities have grown and become more complex, so have transformers. All this expansion in the power field has been paralleled by expansion here at Moloney. Many utilities feel that Moloney Transformers are the best you can buy. They are right, because—



Take, for instance, Distribution Transformers; Of very serious concern in utility planning, is the necessity of investing more capital in operating equipment. System planning is encountering greater load demands that often require larger Kva distribution transformers than those which formerly were adequate. Moloney HiperCore Distribution Transformers, in addition to superior operating characteristics, offer weight advantages which in most cases eliminate the necessity of replacing existing poles with larger ones when installing larger Kva transformers.

ME54-18

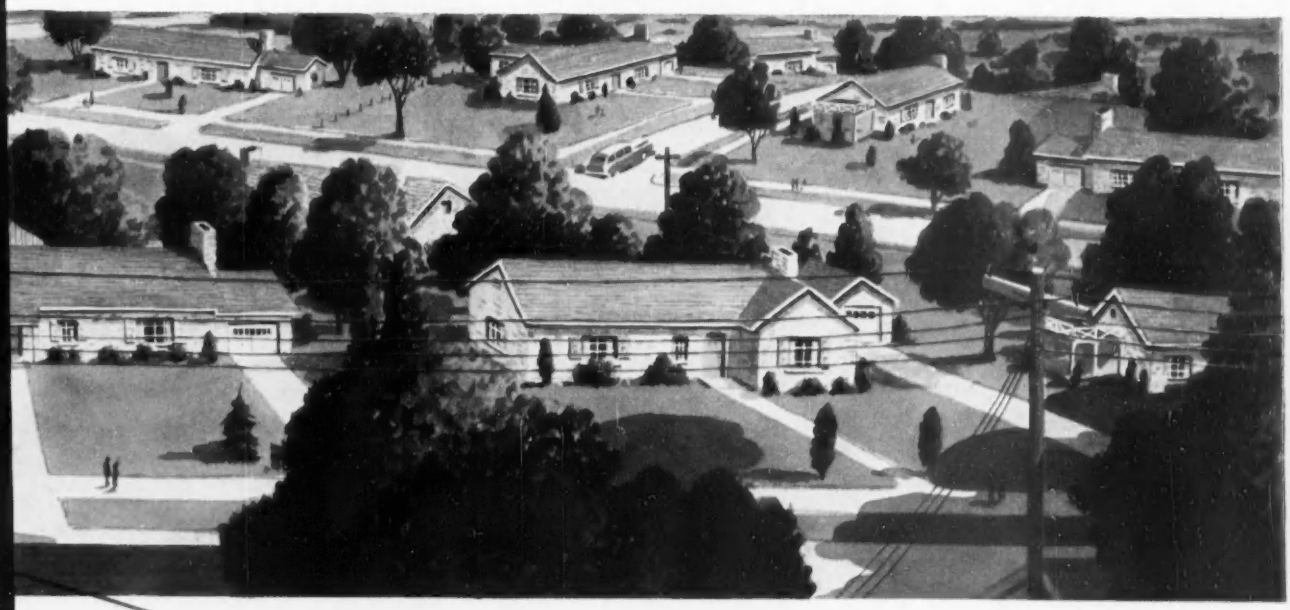


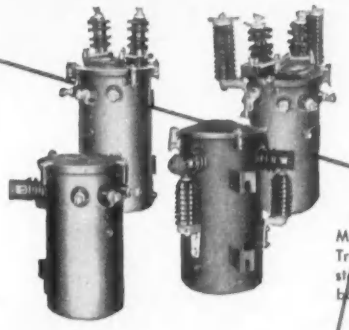
MOLONEY ELECT

Manufacturers of Power Transformers • Distribution Transformers • Load Ratio Control

FACTORIES AT ST. LOUIS 20, MISSOURI AND TORONTO,

THE LINE!





Moloney HiperCore Distribution Transformers are available in all standard ratings from 3 Kva up in both Conventional and CSP designs.

R I C C O M P A N Y

Transformers • Step Voltage Regulators • Unit Substations • Electronic Transformers

ONTARIO, CANADA • SALES OFFICES IN ALL PRINCIPAL CITIES

G&W is supplying new Garrison Dam with First 230,000 volt Potheads in the U.S.A.

G&W POTHEADS will provide the necessary protection to this important installation of high pressure oil pipe type cables operating at 230,000 volts. The potheads meet the voltage withstand tests (A.I.E.E. Standards No. 48) . . .

Impulse, 1.5 x 40 ms, crest Kv., full wave
—1,050,000 volts
60 cycles, RMS.
—1 minute dry—545,000 volts
—10 seconds wet—445,000 volts

The cables connect transformer banks to the switching station. The hydroelectric power plant will have a potential output of 400,000 Kilowatts.

G & W ELECTRIC SPECIALTY CO.
7780 Dante Avenue, Chicago 19, Illinois
Representatives in principal cities of U.S.A. In Canada—Powerlite Devices, Ltd.

Preparing the wrapped tape stress relief cone prior to the assembly of the supplementary porcelain tube for internal stress control.

AT-541

G&W

Bell Makes Battery Powered by Sun

INVENTORS of the Bell Solar battery, G. L. Pearson, D. M. Chapin, and C. S. Fuller, check sample devices for amount of electricity derived from sunlight, here simulated by a lamp

A simple-looking arrangement of silicon strips recently converted sunlight directly into a useful amount of electricity at the Bell Telephone Laboratories, Murray Hill, N. J.

Although the sun supplies to the earth more than a thousand trillion (1,000,000,000,000,000) kwhr of energy daily, comparable with all the reserves of coal, oil, natural gas, and uranium found on the earth, man has never converted more than a minute fraction of this energy directly to his use.

At Murray Hill, energy from the sun has been converted for the first time into sufficient electricity to power the transmission of voices over telephone wires and to energize a transistor radio transmitter carrying both speech and music.

Bell scientists claim for their solar battery a 6% efficiency in changing sunlight into electricity. This compares within the integer bracket with the efficiency of steam and gasoline engines and contrasts with other photoelectric devices which have never been rated higher than 1%. Improved techniques, now being explored, the Bell scientists said, are expected to increase this efficiency substantially.

Weston Patented Solar Energy Conversion Device in 1888

Schemes for converting solar into electrical energy have inspired inventors down the years. What was perhaps the first of the early patents for converting solar energy into electrical energy, and then storing it, was issued to Edward Weston, founder of Weston Electrical Instrument Corp, Sept. 4, 1888. Weston's scheme used a thermopile and storage battery.

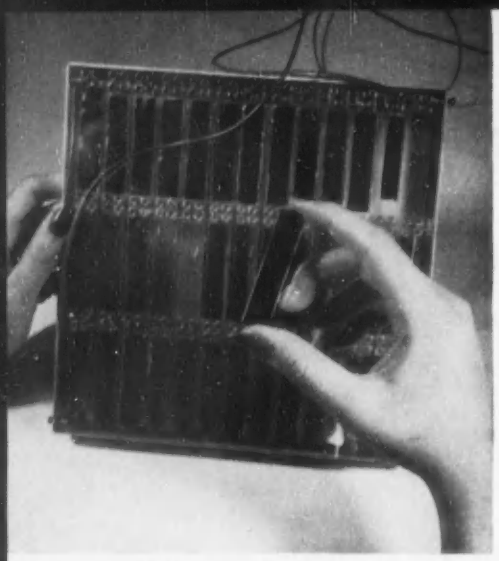
The following excerpt is from the specification forming part of Letters Patent No. 389, 125:

"The object of the storage or secondary cell is to accumulate the solar radiant energy in the form of electrical energy, so that, for example, energy accumulated during hours of sunshine may be utilized during night or periods of cloudy weather; or, in other words, said cell here acts substantially as a reservoir into which electrical energy may be intermittently delivered, but from which it may be taken as a constant supply.

"I am well aware that various devices have been contrived for directly utilizing solar heat to produce steam or hot air, or for measuring the intensity of solar radiations; but I am not aware that the utilization of the sun's heat and light-rays through the conversion of solar radiant energy into electrical energy or into mechanical energy through intermediate conversion into electrical energy has hitherto been accomplished."

On July 14, 1932, in applying for the patent for a photoelectric device, Anthony H. Lamb, assignor to Weston Electrical Instrument Corp, stated:

"Whether the actinoelectric layer be crystalline selenium or one of the other materials noted above, a photoelectric device such as shown . . . has the property of generating a voltage between electrodes . . . when the collecting electrode face of the layer is exposed to light and its opposite face is dark. The voltage so developed is of a very low order of magnitude but a substantial flow of current may be established in an external circuit between the electrodes."



POWER at rate of 50 w/sq yd of surface is delivered from the sun by silicon device

Power Capability . . . The Bell solar battery, they added, theoretically should last indefinitely as nothing is consumed or destroyed in the energy conversion process, and there are no moving parts. The experimental solar battery uses strips of wafer-thin silicon about the size of common razor blades. These strips are extremely sensitive to light. Linked together electrically, they can deliver power from the sun at the rate of 50 w per sq yd of surface.

The atomic cell announced recently by the Radio Corp of America delivers a millionth of a watt. Thus the new Bell device delivers 50 million times that much power.

Scientists have long sought a practical method of converting the limitless energy of the sun directly to electricity. Until now only the thermocouple and the photoelectric cell, limited by their natures to handling minute quantities of power, have been available.

Silicon Program . . . The silicon used in the solar battery is obtained from common sand. A semiconductor, it is chemically related to germanium, the material used in most transistors. Silicon has a much greater electronic stability at higher temperatures than other semiconductors. Its use in the battery resulted from a broad program at Bell Laboratories for studying silicon and its possible application in electronics.

P-n (positive-negative) junctions built into germanium single crystals are the basis for the junction transistor invented at Bell Laboratories. The unique electrical properties of silicon devices depend on substitution of silicon as the crystalline material in which p-n junctions are made by controlled introduction of traces of impurities. This is accomplished by heating the semiconductor wafer in the presence of a suitable impurity vapor. Introduced at a precise rate and under carefully controlled conditions, the impurities reach a depth of less than 1/10,000 in.

Among other silicon devices studied at Bell Laboratories is a lightning protector for telephone lines which would be more compact and easier to maintain than those now in use. Also under study is a power rectifier for converting very large amounts of alternating current to direct current. All these devices operate at much higher temperatures than other crystal rectifiers in use. They will be applied where ruggedness, long life, and reduced maintainance cost will make them particularly desirable on the Bell System.

Device's Possibilities . . . Bell scientists conceded that it will be some time before large-scale power installations will be possible, if ever. The earliest applications of the solar battery will be in communications whose power requirements are low. Attached to telephone poles the solar battery could power a telephone system and charge storage batteries to provide power at night.

At the demonstration of such a system in miniature, Bell scientists pointed out that solar batteries would probably be tried experimentally in Georgia where transistors are in use in telephone amplifiers as an experiment.

In producing large-scale power, the battery would be in competition with atomic, coal, and oil energy sources. At present a steam power plant costs about $300 per kw. Then the cost of fuel must be considered. An atomic plant would be much more expensive even though the fuel is almost without cost.

Should the scientists reach a 10% efficiency in the solar battery and the cost of each unit be reduced to about a half cent by mass production methods, each kilowatt of installed sun power would be about $100; and the fuel would be free.

At the solar battery's present stage, however, a 30,000-kw plant, which is the industrial size, would cover 300,000 sq yds, or about 60 acres.

Raver Requests $10,000 for Pool Engineering Study

A $10,000 appropriation from City Light funds to help pay for the expenses of a consulting engineer to be hired by the Puget Sound Power Pool has been requested of the Seattle City Council by Paul J. Raver, City Light superintendent.

Seattle and Tacoma City Light, the Chelan and Snohomish PUD's and the Puget Sound Power & Light Co have agreed to spend $40,000 for engineering studies to coordinate their future power developments.

The engineer will assemble each utility's estimate of its loads and existing resources for each year during the next decade, plus possible developments. He will review the expansion proposals of each utility to determine the combination and sequence of the feasible projects, and investigate the place of steam plants in the operation of existing and proposed hydroelectric plants.

The engineer also will study the coordination of existing and proposed power resources with the Northwest Power Pool and determine the best procedure for the members of the group to follow in securing their power requirements at the lowest cost, Raver told the Council.

Stanford Research Office to Make NW Power Studies

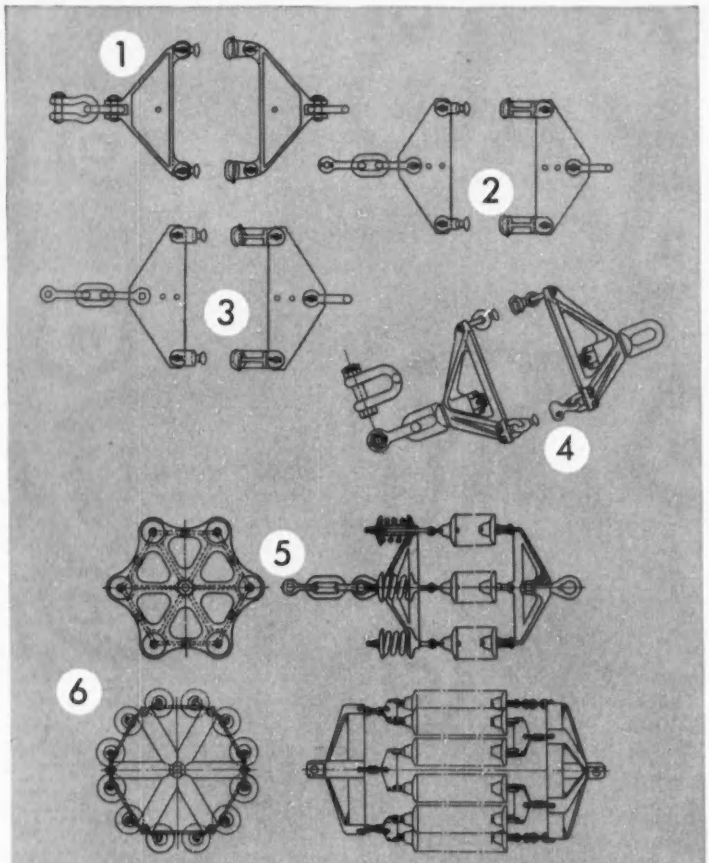
Stanford Research Institute has opened Pacific Northwest offices in Portland, Ore. Director Jesse E. Hobson reported a principal concern would be "studying long-range development of power and water resources" of the region.

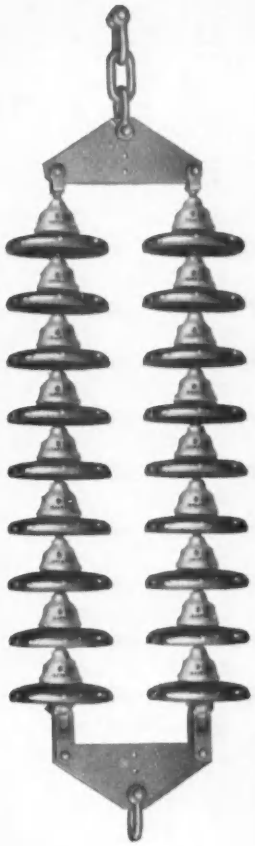
"We're interested in energy as such," Dr Hobson declared. "It is the most basic thing there is."

Hobson reported Patrick M. Dowling, previously assistant to the director of international research at the institute, would head a staff of three or four assigned in Portland.

The institute is a corporation wholly owned by Stanford University. Cooperative work is often done with other university staffs and Hobson said it was the hope that similar projects might be handled together with colleges of the Pacific Northwest.

Paul B. McKee, president of Pacific Power & Light Co, is a director of the institute.





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1 Light Duty Malleable Iron Double Strain Yoke
2 Medium Duty Steel Double Strain Yoke
3 Heavy Duty Steel Double Strain Yoke
4 Triple-string Yoke
5 Six-string, Spring-equalized Yoke
6 Twelve-string, Lever Load-dividing Yoke

Working together, we can solve your problems in dead-end construction for extra-heavy-duty spans. The job doesn't come up often, and so most power companies don't have a great deal of past experience to draw upon to get it done. Our Ohio Brass engineers do have that sort of experience. Being manufacturers of suspension insulators, we have just naturally been drawn into innumerable high-strength dead-end jobs, and the experience we've gained is at your disposal.

As a result of much work with this sort of dead-end, O-B has been able to prepare several standard sets of hardware to meet most multiple-string dead-end applications. More frequently, however, those using more than six strings of insulators require special engineering treatment. In cases like this, O-B is well prepared to work once again at a now (to us) familiar job.

Let's team up on it when, if ever, you need an unusual yoke design!

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4436-H

ENGINEERING MEETING

Industrial Turbines Discussed

ASME panel holds central station power is more economical for industries than energy generated by small condensing plants

Small condensing turbines, 10 Mw and below, operated by industrial plants for power supply purposes cannot compete with power purchased from a utility. Nor, can such turbines be standardized to the same degree as central station turbines because of the influence of industrial processes on turbine characteristics.

These were the conclusions of a panel discussion on the future design and place in the power field of industrial turbines that was sponsored by the Philadelphia Section of American Society of Mechanical Engineers and held in Trenton, N. J., recently.

Factor of Economics . . . Majority of discussers including six engineers from companies using steam processes, two consulting engineers, and two utility power salesmen agreed that it is uneconomical to operate industrial turbines condensing to generate power. J. Erickson, Philadelphia Electric Co, and S. L. Chapin, Public Service Electric & Gas Co, gave these reasons why their industrial users were buying power instead of generating it:

1. Costs of industrial power plant equipment, labor, fuel, etc, have increased from two to three times since 1940, while utility rates have risen comparatively little.

2. Industries have been unable to gain the full benefit of higher efficiencies from use of higher pressures and temperatures. Increase in efficiency can only be fully realized in very large turbines—larger than the total load of most industrial plants.

3. Industrial managers are becoming firmly convinced that activity foreign to the task of concentrating on the product they manufacture is not good management.

4. Industries have found that a greater return can be made by putting the money in production equipment or modernization than by putting it in power plant equipment.

5. Industries have found that parallel operation of a small unit with a large system can be difficult.

Standardization of sizes, pressures, and temperatures for industrial turbines is not practical at present agreed the majority of industrial users and consultants. This is because processes, which are being constantly changed to get greater efficiency, cannot be standardized. And industrial users of turbines cannot afford to standardize processes for auxiliaries.

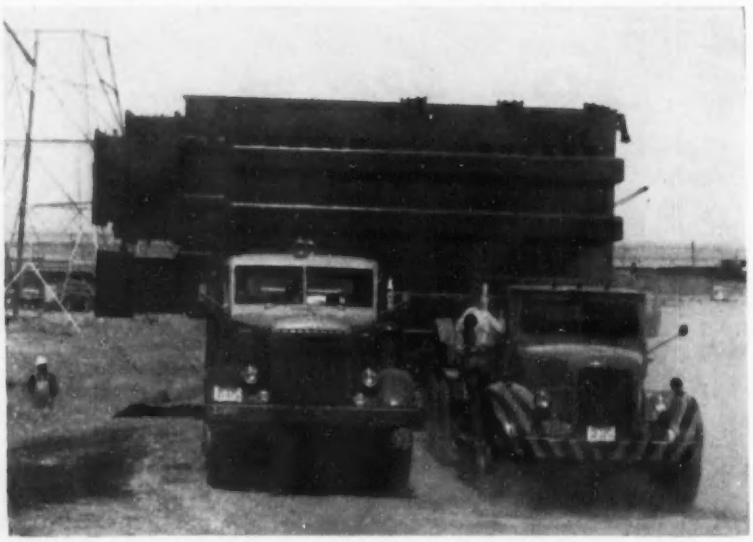
SMUD Requests Permit for White Rock Project

Sacramento Municipal Utility District has applied to the Federal Power Commission for a preliminary permit for the proposed $16-million White Rock power development on the South Fork of the American River north of Placerville, Calif.

The proposed development is part of the district's $80-million American River project, for which water right applications are now pending before the state engineer. The original application to the FPC did not include the White Rock power plant, one of four proposed by SMUD.

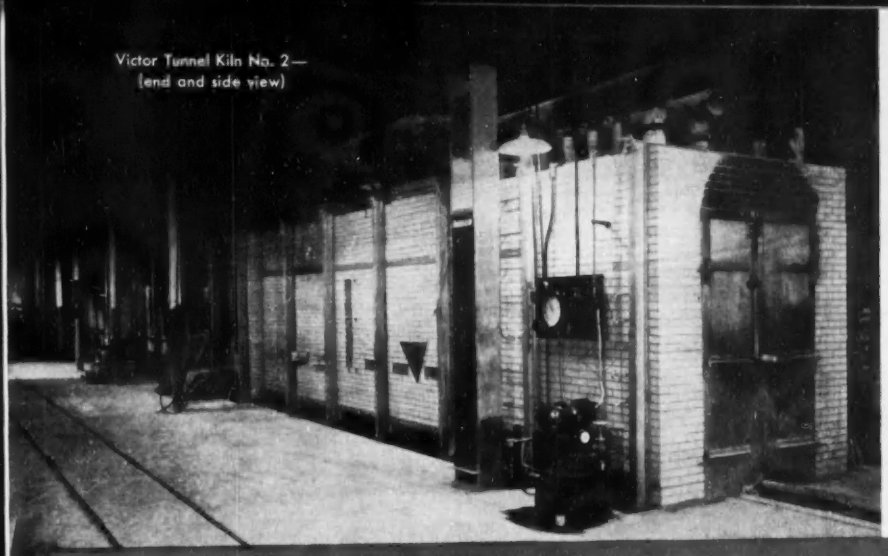
The White Rock development would consist of an arch concrete dam 130 ft high, a 9-mile tunnel, and a power plant with a capacity of 46,000 kw.

Engineers' estimates show SMUD's present power supplies could be exhausted in five or six years and it will take some three or four years to construct the hydroelectric development. SMUD Board President Royal Miller said his staff are examining the possibility of construction of a steam plant that could serve the district's needs during an interim period and eventually be used to firm up the power that could be developed by the American River hydro plants.



Trailers Team Up to Move a Transformer

Two 50-ton low-bed trailers were chained together to move an 80,000-kva, 138/161-kv transformer 1,000 ft from the rail siding to its location in the Don Substation of Idaho Power Co. Weighing 286,000 lb complete, the unit was jacked up and pulled over greased steel skids from the flatcar to a timber platform and then to the parallel trailers. Before the move, the insulating oil, weighing nearly 100,000 lb, was pumped into tankers. The road had to be widened and part of the substation fence was removed preparatory to the move.



Victor Tunnel Kiln No. 2—
(end and side view)

Tunnel Kiln Operating Mechanism

Another Reason Why—

VICTOR Makes Better Insulators

WE USE RECIRCULATING TUNNEL KILNS EXCLUSIVELY!

The firing process can literally make or break an insulator. By leaving nothing to chance, Victor "know-how" gives you the most perfectly fired high and low voltage insulators that money can buy.

Employing tunnel kilns exclusively, Victor research has done much to advance firing techniques. The use of re-circulation of heat to attain accurate, even temperature control, the use of optical pyrometers to measure tunnel kiln temperatures, automatic control instruments and silicon carbide kiln furniture are examples.

No wonder Victor *Purified* Porcelain Insulators are harder, denser, have more impact resistance, last longer and ultimately cost less! For the full story, send for our free booklet, "The Story of Victor and Purified Porcelain." Tells how research made possible this great insulator advance.

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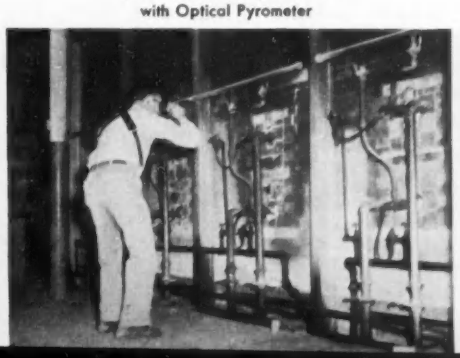
Low and High Voltage Pintypes • Suspensions • Guy Strains • Spools • Switch and Bus Insulators
• Custom Designed Porcelain • Insulator Hardware

Loaded Car Entering Tunnel Kiln

Checking Kiln Temperatures
with Optical Pyrometer



Tunnel Kiln Control Panel

2 AFL Leaders Are Indicted

Federal grand jury charges union heads with conspiring to extort $1 million from Ebasco and EEInc on Joppa plant

Two Illinois American Federation of Labor union leaders were indicted recently by a federal grand jury for the Eastern District of Illinois. They were charged with feloniously conspiring to extort $1,030,000 from two companies in connection with the construction of the power plant at Joppa, Ill.

The two companies involved are: Ebasco Services, Inc, the general contractor, and the Electric Energy, Inc, the owner of the plant.

The two defendants are:

Evan Raymond Dale, president of the Southern Illinois District Council of the International Hodcarriers', Building and Common Laborers Union of America.

James Bateman, Murphysboro, Ill., agent and representative of Local 160 of the United Association of Pipefitters, affiliated with the United Association of Journeymen and Pipefitting Industry.

First Count . . . The first count charged that Dale and Bateman began in April, 1951, a conspiracy to extort money from Clinton J. Sammond, industrial relations consultant, and Arthur J. Mohan, resident labor consultant, both of Ebasco Services, and Edward M. Marselli, assistant general plant superintendent for EEI.

The two union leaders were charged with "calling and conjuring up strikes, causing labor disputes, work stoppages, and difficulties" in connection with the construction of the plant.

Ebasco had been forced to give up the job because of delays and mounting costs, in which numerous labor disputes were a factor. The job was assigned to another contractor.

Dale and Bateman, it was charged, threatened to exercise force and power in their capacities as union officers to cause work stoppages and other labor troubles if the extortion demand were not met.

In the third count Dale was charged with extorting $7,500 from John E. Burke, vice president and treasurer of the Maxon Construction Co, a sub-contractor at the Joppa development.

Engineers' Income for '53 Listed in New EJC Booklet

Engineers Joint Council has released a pamphlet entitled "Professional Income of Engineers—1953." The 32-page booklet is the final report of a survey conducted in 1953 by the EJC Special Surveys Committee whose chairman is M. M. Boring, manager, technical personnel division, General Electric Co.

The report contains information covering the professional income of about 72,000 engineers employed in industry, government, and engineering education. This represents about 22% of the total of engineers estimated to be employed by industry and engineering education. The basic presentation of data is in relation to year of receipt of first degree in engineering.

Income of engineers employed in industry is presented by type of industry in which employed. This is a departure, the council said, from practices employed in earlier surveys which presented data by engineering specialties.

The report is available from EJC, 29 West 39th St., N. Y. 18, at $2 a copy with a discount of 50% for single copies to members.

Making Plans for EEI Personnel Parley

Members of the Industrial Relations Committee of the Edison Electric Institute are shown above working on plans for the annual Round-Table Personnel Conference to be held at the Palmer House in Chicago on Sept. 27-29.

Highlights of the meeting will be addresses by Harold Quinton, president, Southern California Edison, who will speak on "Light's Diamond Jubilee;" R. C. Simpson, Gilbert Associates, Inc, whose topic will be "The Employee Looks at Management;" and Allen S. King, president, Northern States Power, who will discuss "Management Looks at the Employees."

Members of the committee shown above (l to r) are: John C. Arnell, Consolidated Edison Co of New York; E. J. Brill, Pennsylvania Power & Light; Edward S. Evans, secretary; Donald A. Bartlett, chairman of the committee, Western Massachusetts Electric; J. W. Carothers, Consolidated Gas Electric Light & Power of Baltimore; and M. Osterling, Hartford Electric Light.

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The 1 Source
for utility bodies and equipment!

If your work calls for one service body or a hundred . . . if you can use standardized units or require custom-made equipment . . . you'll find a body to fit your needs in the Powers-American line. Ladders, reels, racks, hooks, brackets, shelves, and other special items of equipment, can be furnished for your particular work requirements.

May we help you with your service body problems? Complete details will be sent upon request.

Series 44L and Series 44 (shown above) designed for any general service work. Fully-equipped with shelves and bins. For ½, ¾, 1, and 1½ ton chassis.

Series 25T and 35T arranged for telephone installation and service. Widely used in other phases of utility work. Available in ½ and ¾ ton sizes.

Series 25M and 35M used for all types of general service. Especially suitable for electric meter installation and maintenance. Models for ½ ton and ¾ ton vehicles.

Series 25G and 35G designed for use in the installation and servicing of gas meters. Equipped with meter hold-downs, bins, and pipe rack. In ½ and ¾ ton sizes.

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428 LATHAM SQ. BLDG. • OAKLAND 12, CALIF.

"We are going to become a regular ball of fire."

Pres
Frank McLaughlin

"Operation Jet is just the beginning."

General Sales Manager
Pat Johnson

Operation Jet Means Load Building

Puget Sound P&L salesmen take to the field to increase gross kwhr usage 11%. Sales reserves thrown into drive to add $170,000 of revenue from new load

Operation Jet in March marked the re-entry of Puget Sound Power & Light Co into the field of load building. Former sales personnel, who were held in reserve in operating and accounting positions, took to the field to meet the 1954 campaign goal of an 11% increase in gross kwhr consumption. Salesmen have a system-wide quota of $170,000 from new connected load to add by Dec. 31.

Puget Power is envisioning a large-scale capacity expansion program and will back it up this year with Operation Jet. In setting the pace for the campaign, Pres. Frank McLaughiln said, "This is our finest hour. We are going to become a regular ball of fire." The flight number of Operation Jet is XSP-54—expanding sales program for 1954. The campaign will touch all classes of customers served by the company. To spark the program are contests for sales consultants, local office managers, division sales managers, and division managers. Prizes include free tickets to local sporting events, a water show, a salesmen's roundup to be held in Seattle, and watches.

Everyone in the Campaign . . . Plans for Operation Jet were laid in December at a meeting of vice president and general sales manager Pat Johnson and division sales managers. Within a week division managers held meetings in each of the four divisions to explain the program to Puget's sales consultants, office managers, department heads, and operating and accounting supervisors. To acquaint the public with the coming campaign, news of each meeting was broadcast to local papers.

To implement the program, two-day refresher schools were held for farm consultants and commercial and industrial consultants. Instructors were sales directors of Puget Power and representatives of electrical equipment manufacturers and distributors. Following the refreshers, sales crews received detailed prospect lists for load building in the home, farm, commercial, and industrial fields.

Before the D-day of March 1, salesmen took test runs with customers to polish up sales techniques. During the year, four campaigns will run with progressively higher quotas of monthly revenue to add. Quotas started in March at $11,000 and will peak through October-December at $21,000 per month.

Awards Will Hold Interest . . . To add zest and to maintain interest in Operation Jet, division managers will compete for a watch to be awarded to the division having the largest percent increase in gross revenue. Local office managers will vie for a watch to be given for the highest percent increase in all-electric (cooking and water heating) customers. Salesmen and sales consultants will compete on the same basis of load building quotas during each campaign. A nominal prize will be awarded to all who reach their quotas, with another award to top man for the company.

Quotas and objectives of Operation Jet have been set for each class of customers. In the rural class, new revenue to be added is $50,000 and objectives include:

1. Assistance in saving time and labor through application of up-to-date proven practices.
2. Supply information on needed farm equipment.
3. Point out savings gained through use of electricity.

Emphasize Certain Loads . . . Specific applications that will be sought include brooding and incubating load, irrigation and farm water systems, motors for greater mechanization, lighting, heating and refrigeration for dairy farms, and electric heat for greenhouses.

One primary objective of the home service program will cover training of teachers, extension agents, and dealer salesmen in the use and care of appliances and residential lighting. Demonstrations planned for 4-H club members will cover lighting and food preparation.

Assistance will be given to dealers in the arrangement of cooking and laundry schools. The home service director on request will conduct special classes in high schools and colleges on the use and care of appliances and lighting. To meet the inroads of gas competition, stress will be placed on the use of electrical equipment in home economics laboratories and classrooms.

Commercial Quota Is $120,000 . . . In the commercial sales program, individual quotas of $15,000 in additional revenue have been assigned to the eight sales consultants. All phases of commercial lighting—store, office, outdoor for sports and safety, school, and street—will be emphasized. To push lighting, consultants will have to make 26 contacts per month with stores, offices, and schools.

Commercial cooking and water heating will be stressed during the three contacts per week that each sales consultant will make with drug stores and restaurants. Contacts will depend on the results of a field survey to determine the commercial cooking market and its load building possibilities. Survey forms will be tailored for stores, offices, and food service concerns. Follow-up for sales of equipment will be handled through contractors or distributors.

Industrial Program Has Three Aims . . . Objectives of the industrial sales program are:

1. Retention of load in face of competitive fuels.
2. Full electrification of each industrial customer.
3. Promotion of sound area industrial development.

Quotas of personal calls are: Customers with 100 hp and over, five calls per week per division; customers with 50 to 100 hp, ten calls per week per division. In addition to calls, sales consultants will be expected to attend customer's association meetings, work with manufacturers' representatives and agents, and participate in industrial development activities.

Sales managers plan for XSP-54 . . .

Industrial and commercial men study . . .

Farm consultants study prospect lists

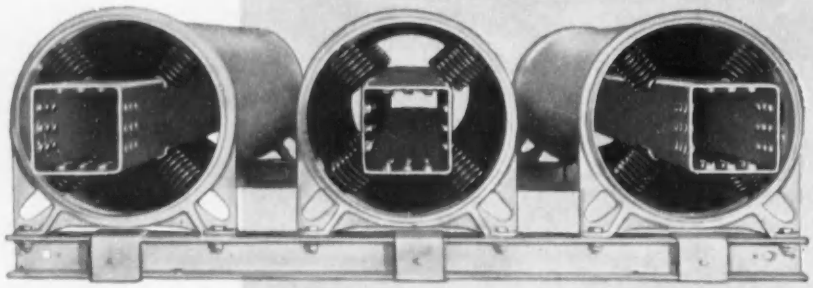
Salesmen Are Eager Beavers

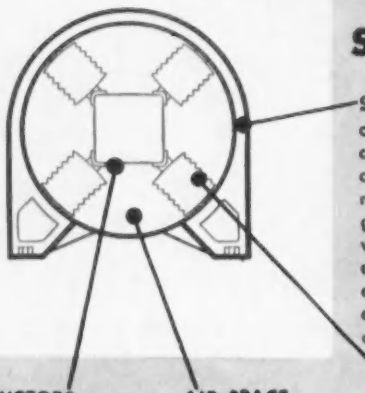
Operation Jet may be fast, but Puget Power's salesmen are even faster. After receiving their first briefing, the salesmen didn't bother waiting for the campaign's opening date but went right to work. The results: For the first quarter, the budgeted sales effort revenue of $25,750 on an annual basis was topped by a total of $32,095. Residential use went up 60 kwhr in January and 70 in February. But the company admits that all of the gains are not attributable to Operation Jet.

What Isolated Phase Bus is

Transmitting huge quantities of electrical energy at generated voltage is a job for an especially reliable type of conductor. Generator leads, transformer leads, feeders, and main and transfer buses in generating and distribution stations form key links in the nation's power networks. They must possess high dielectric and mechanical strength.

I-T-E Isolated Phase Bus is designed to meet all these electrical and mechanical essentials. It is a structure of heavy copper conductors, one to a phase, each enclosed in its own grounded metal shield. This basic design characteristic completely eliminates phase-to-phase faults in the most economical way possible.





Simplicity is the keynote

SUPPORTING RINGS of strong cast aluminum connect the light metal cover electrically and mechanically to grounded plant steelwork. Tightly gasketed aluminum covers make a single design suitable for indoor or outdoor use.

CONDUCTORS— one for each phase— are of copper or aluminum in round or square cross-section. Lengths up to twenty-four feet are joined end to end with solid, flexible, or braided connectors.

AIR SPACE insulation is unchanged by heat or age. Because air is free and inexhaustible, it does not have to be replenished or kept under pressure.

INSULATORS are of solid, non-aging porcelain, radially disposed to withstand compression. Insulators cradle conductors to allow free movement when conductors expand or contract.

The construction of I-T-E Isolated Phase Bus is as simple as its neat appearance suggests. Complete phase isolation—the fundamental requirement—is achieved through the arrangement and construction of conductor, insulator, and housing.

Light weight, freedom of movement for conductors, adequate cooling, and other requirements are provided for through use of a few simple parts.

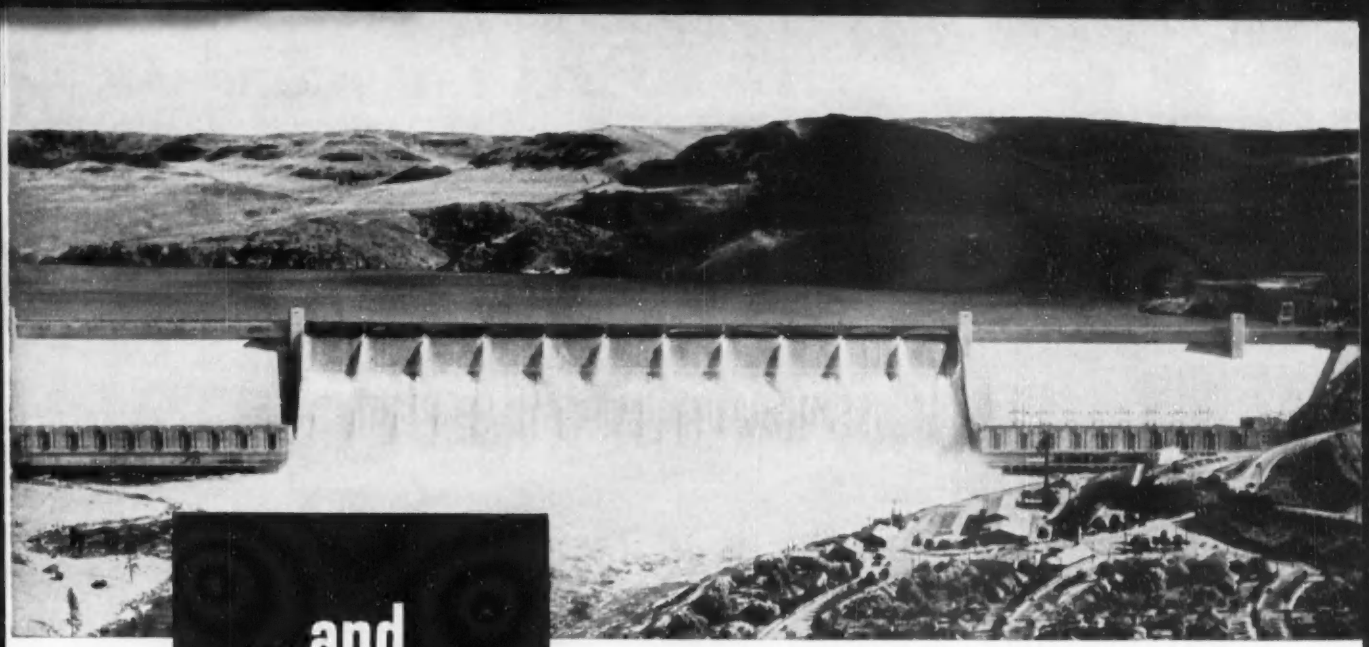
For details, check the I-T-E Application Engineer nearest you.

I-T-E

ISOLATED PHASE BUS

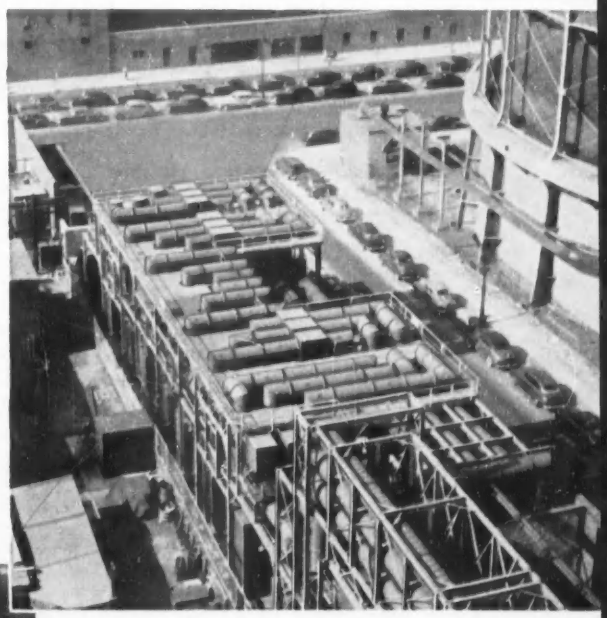
I-T-E CIRCUIT BREAKER CO. • 19th and HAMILTON STS. • PHILA. 30, PA.

R&IE EQUIPMENT DIVISION, GREENSBURG, PA.

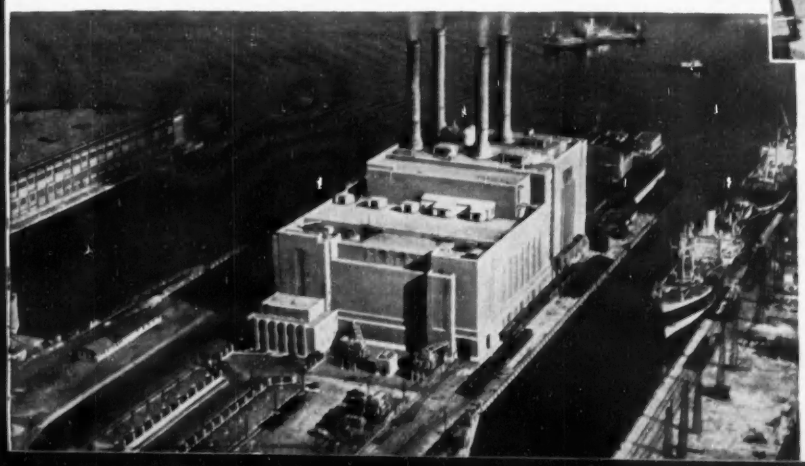


...and where it is used

Hydroelectric generators—
including the world's largest waterwheel-driven machines, deliver vast quantities of power through safe I-T-E Isolated Phase Bus runs.



Steam plants—
are being built with larger and larger generators. I-T-E has design experience and production facilities to keep pace with the nation's expected power expansion and with rapid increases in generator output ratings.



Switching stations—
of the most modern types use I-T-E Isolated Phase Bus runs to connect transformers and distribution switchgear. The installation pictured here employs 69-KV bus structures at a utility central station.

THIS IS A HIGH CURRENT TRANSFORMER BUSHING

This assembly does not appear to be very complicated. As a matter of fact, it isn't. Its design represents no masterpiece of engineering ingenuity. No serious troubles are involved in its manufacture. It's a routine "special job"—*for Lapp.*

The point is just that—that such jobs are routine at Lapp. This piece is the result of the inquiry from a transformer manufacturer, "What can you make us in the way of 3200-ampere 2500-volt bushings?"

The assembly, as you see, is trim, neat and functional. Designed to solve a vexing problem, it does its job dependably.

We call your attention to it only because it illustrates the ability and willingness of Lapp to design and produce insulating assemblies to meet specific and unusual conditions. And these are skills and facilities which have been called on so many times over the past 38 years, for solution of so many kinds of problems, that we think we now know how to approach almost any requirement involving high-current and/or high-voltage insulation. Not only in bushings—which we've produced successfully in just about every design known—but also transmission line and station insulators—and other types of special porcelain for America's best manufacturers of equipment.

Lapp Insulator Co., Inc., Le Roy, N. Y.

Lapp

Australia Hydro Job

U. S. construction group is awarded $56 million contract for Snowy Mountains project

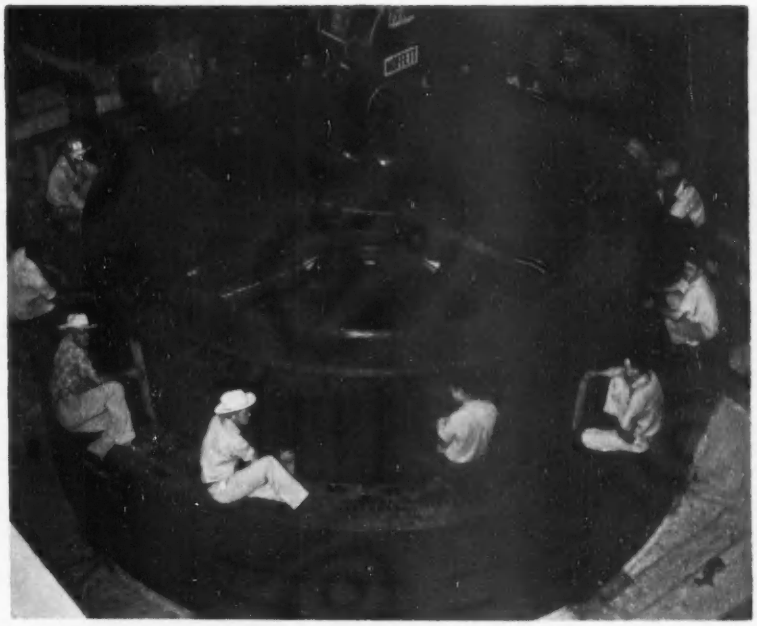
MELBOURNE (McGraw - Hill World News)—The contract for work on Australia's $1 billion Snowy Mountains hydroelectric project has been awarded to an American group of construction contractors. Kaiser Engineering Division of Henry J. Kaiser Co heads a Kaiser-Walsh-Perini-Raymond group of construction firms which also includes General Construction Co of Seattle, Wash.

$56 Million Contract . . . The successful bid was for £A25,296,586 ($56 million) and an official spokesman told McGraw-Hill World News that it would be subject to variations only on account of fluctuations in wage rates and cost of certain materials and for actual quantities of work performed. The official spokesman, however, declined to elaborate on these additional conditions, but it is thought that the successful Kaiser Group has persuaded the Australian authorities that it must have certain guarantees against a sudden increase in costs of materials or Australian labor costs.

The contract, reported to be the largest ever let by the Australian Federal Government, involves construction on a 14-mile tunnel through the Snowy Mountains of Southeast Australia, a concrete arch dam 290 ft high and 715 ft long, a smaller diversion dam and other projects.

Turbine, Generator Orders . . . Where contracts for the projects' water turbines and generators are concerned greatest interest centered on Japanese tenders. It is understood that the Japanese offers proved disappointing and two water turbines will be purchased from England Electric Co, Ltd, of London at £A460,945 ($1,025,000). Two generators will be purchased from the Australian subsidiary of A.S.E.A. of Sweden Electric Co at £A552,320 ($1,225,000).

Project's output is scheduled to be 160,000 kw in 1958-59 and double that amount in the following year. Contract work is expected to divert 300,000 acre ft of irrigation water to Murrumbidgee River system in 1959.



Elliot Rotor Gets a Close Fit

The 75-ton rotor of a 17,895-kva hydraulic turbine generator being built by Elliott Co for the power plant at Tenkiller Ferry Dam, Gore, Okla., is shown being lowered into position in the core of its stator. Extreme care is exercised in this operation to avoid damage to the stator coils. The rotor, assembled in the Ridgway, Pa., plant of Elliott, is 18 ft in diameter. It must be placed level and square with a ½-in. air gap.

Fabricators Assured Metal in Alcoa, Alcan Settlement

Settlement of the Justice Department's antitrust action against the Aluminum Co of America and Aluminum, Ltd., of Canada (Alcan) guarantees to independent fabricators in the U. S. a minimum supply of 110,000 tons of Canadian metal for each of the next six years.

The Justice Department last July attacked a six-year contract between Alcoa and Alcan, calling for sale to Alcoa of a total of 600,000 tons of metal. Justice Department antitrusters asked cancellation of the contract, charging it violated court decisions in 1950 and 1951 designed to break Alcoa's monopolistic position and to sever corporate ties between Alcoa and Alcan. Government lawyers also contended contract threatened to defeat U. S. efforts to promote a "third round" expansion of domestic aluminum ingot output.

Policy decisions elsewhere in government to review the whole question of a third round expansion knocked this element out of the case. The consent order signed does not cancel Alcoa's contract, but does give preference to independent fabricators over Alcoa should Alcan be unable to fulfill obligations to both in the future.

The order also requires Alcoa to offer the equivalent of 25% of its contract purchases from Alcan to Olin Industries, Inc, a competitor in aluminum manufacture and fabrication. The order forbids Alcoa and Alcan from extending or enlarging present contract without prior approval of Attorney General Brownell.

British Firm Low Bidder On Chief Joseph Units

The $1,946,410 net bid of the English Electric Export & Trading Co has been evaluated as the lowest received by the Corps of Engineers at

Seattle for furnishing two alternating current generators for Chief Joseph Dam (EW, May 3, p 69).

The American Elin Corp earlier had been announced as the apparent low bidder at $1,996,115 on the specified minimum efficiency rating of 97.9.

The English firm's lower net bid was based on the application of one-half of its escalator allowance of 7% and on an efficiency rating of 98.25. The engineers allowed $2,975 for each 1/100th of 1% above the minimum efficiency rating in their evaluation.

Net bid of the Westinghouse Electric Corp after evaluation was $2,215,374, based on half of its 10% escalator and on an efficiency rating of 98.15.

Alcoa Dedicates Its New Rockdale Works

The new four-potline Rockdale Works of Aluminum Co of America was formally dedicated at ceremonies held recently at Rockdale, Tex.

Alcoa's Rockdale Works, which adds 90,000 tons annually to the nation's expanding aluminum-smelting capacity, is the first aluminum smelting plant to use electric power generated by burning lignite as fuel for firing steam turbogenerators.

Power for the Rockdale operations is being provided by the Sandow Power Plant, adjacent to the smelting facilities. The power plant is owned by Alcoa, but is operated by the Industrial Generating Co, an affiliate of Texas Power & Light Co, for Alcoa. The lignite deposits are close to the power facilities.

All four of Rockdale's Aluminum smelting potlines are now in operation. The potlines are using power generated by the nearby Sandow Power Plant.

MANUFACTURING BRIEFS

Kuljian Corp, Philadelphia engineers and constructors, has been awarded about $15 million in contracts for the design and construction of a building for the first two units of a $45 million power plant in Caracas, Venezuela, planned by C. A. La Electricidad de Caracas. The plant, to be known as the Planta Tacoa, is expected to be in commercial operation by September, 1955.

Production of primary aluminum in the United States during March amounted to 244,678,349 lbs, the Aluminum Association has reported. March output topped February's production of 220,965,786.

SALES ASSIGNMENTS

COMPANY STAFFS

Bailey Meter Co's Seattle (Wash.) district office has been moved to larger quarters at 200 Broadway. K. E. Atwood is manager of the district which includes Washington, Oregon, western Idaho, western Montana, and Alaska.

Reliable Electric Co, Chicago, has appointed Montague H. Hicks as its district representative for North Carolina, Virginia, and Ohio. Hicks, associated with Carolina Light & Power Co for over 20 years, will make his headquarters at 2713 Lockmore Drive, Raleigh, N. C.

American Steel & Wire Division of United States Steel Corp has announced an exchange of managers in the New York and Chicago district sales offices. Going to the Chicago office as manager is William W. Deal, who is filling the position vacated by Fred L. Nonnenmacher, who goes to New York to take Deal's post as district manager of sales.

MEETINGS CALENDAR

Interstate Power Club
Meetings will be held at Hotel Martinque, New York, on following dates: May 10, Oct. 11, Dec. 6.

Pennsylvania Electric Association
System Planning Committee, Hotel Hershey, Hershey, Pa., May 10-11; Industrial Sales Conference, sponsored by Industrial Committee, Skytop Lodge, Skytop, Pa., May 13-14; Transmission and Distribution Committee, Fort Bedford Inn, Bedford, Pa., May 13-14; Hydraulic Power Committee, The Nittany Lion, State College, Pa., May 17-18; Prime Movers Committee, Castleton Hotel, New Castle, Pa., May 17-18; Communications Committee, Penn-Harris Hotel Harrisburg, Pa., May 20-21; Electrical Equipment Committee, Lord Baltimore Hotel, Baltimore, May 24-25.

Northwest Electric Light & Power Association
Business Development Section, Hotel Boise, Boise, Idaho, May 10-12; Accounting and Business Practice Section, Davenport Hotel, Spokane, Wash., May 20-21; Personnel Section with EEI Industrial Relations Committee, Multonah Hotel, Portland, Ore., July 12-14.

New Jersey Utilities Association
Spring Meeting, Seaview Country Club, Absecon, N. J., May 12-13.

CIGRE
International Conference on Large Electric High-Tension Systems, Paris, France, May 12-22.

***Great Lakes Power Club**
Spring Meeting, St. Joseph, Mich., May 13-14.

Public Utilities Advertising Association
National Convention, Hotel Statler, Boston, May 13-14.

Electrical Women's Round Table
1st Annual National Conference, Sheraton Hotel, St. Louis, May 14-15.

American Institute of Electrical Engineers
Appliance Technical Conference, Subcommittee on Domestic Appliances of Committee on Domestic-Commercial Applications, Morrison Hotel, Chicago, May 17-19; Fourth Welding Conference in cooperation with American Welding Society, Hotel Schroeder, Milwaukee, May 19-21; Conference on Telemetering, Morrison Hotel, Chicago, May 24-26; Summer General and Pacific General Meeting, Hotel Biltmore, Los Angeles, June 21-25; Committee on Petroleum, Conference on Electrical Applications in Petroleum Industry, Mayo Hotel, Tulsa, Okla., Sept. 27-29; Middle Eastern District Meeting, Abraham Lincoln Hotel, Reading, Pa., Oct. 5-7; Fall General Meeting, Morrison Hotel, Chicago, Oct. 11-15.

Pacific Coast Electrical Association
Annual Convention, Hotel Del Coronado, Coronado, Calif., May 19-21.

***Georgia Institute of Technology**
Conference on Protective Relay, Atlanta, Ga., May 20-21.

Northwest Public Power Association
Engineering and Operation Section, Benjamin Franklin Hotel, Seattle, Wash., May 20-21.

Edison Electric Institute
22nd Annual Convention, Atlantic City, N. J., June 1-4; Accident Prevention Committee, Mark Hopkins Hotel, San Francisco, July 1-3.

National Association of Electrical Distributors
Annual Convention, Atlantic City, N. J., June 6-11; Pacific Zone Convention, Mark Hopkins Hotel, San Francisco, Oct. 4-7.

American Society of Mechanical Engineers
Semi-Annual Meeting, William Penn Hotel, Pittsburgh, June 20-24; Fall Meeting, Schroeder Hotel, Milwaukee, Wis., Sept. 8-10.

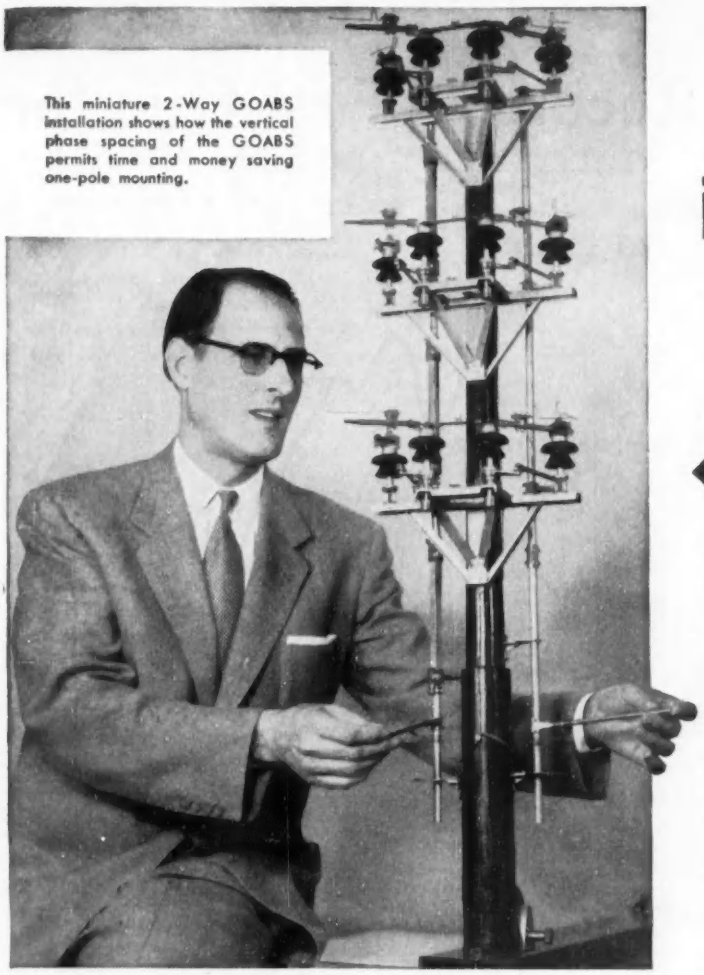
Nuclear Engineering Conference
Sponsored by American Institute of Chemical Engineers, University of Michigan, Ann Arbor, Mich., June 20-26.

*Addition this week.

MANUFACTURERS' EARNINGS

Company	Period Months Ended		Net Income 1954	Net Income 1953	Earnings Per Common Share 1954	Earnings Per Common Share 1953
Aluminum Co of America	3	Mar.	$8,372,105	$13,257,756	$ .78	$1.29(a)
Colorado Fuel & Iron	3	Mar.	771,456	2,177,372	.20(b)	.81(b)
Colorado Fuel & Iron	9	Mar.	5,635,961	4,781,518	2.03(b)	1.84(b)
Copperweld Steel	3	Mar.	282,347	994,550	.43	1.81
Koppers	3	Mar.	1,429,087	2,116,244	.69	1.05
McGraw Electric	3	Mar.	2,626,000	1,789,000	2.56	1.77
Okonite Corp	3	Mar.	351,279	714,216	2.08(c)	4.49(c)
Owens-Corning Fiberglas	3	Mar.	1,703,716	1,383,325	.54	.44
Revere Copper & Brass	3	Mar.	2,321,134	2,163,079	1.80	1.68
Smith (S. Morgan)	3	Mar.	470,635	306,374	....	....
Union Carbide & Carbon	3	Mar.	21,443,770	25,695,100	.74	.89
Westinghouse Electric	3	Mar.	26,286,000	16,858,000	1.61	1.04
			1953	1952	1953	1952
Jefferson Electric	12	Dec.	71,222	370,475(f)	.18	.93

Notes—(a) Adjusted to give effect to the two-for-one stock split in April, 1953; (b) On shares outstanding at close of period; (c) Based on shares outstanding at close of respective periods; (f) Includes $44,000 excess profits tax credit.



This miniature 2-Way GOABS installation shows how the vertical phase spacing of the GOABS permits time and money saving one-pole mounting.

"GOABS can save you 25% in installation costs over conventional air break switches"

Says L. R. (Les) Crane, *Manager of Sales; Switching Equipment, A. B. Chance Company*

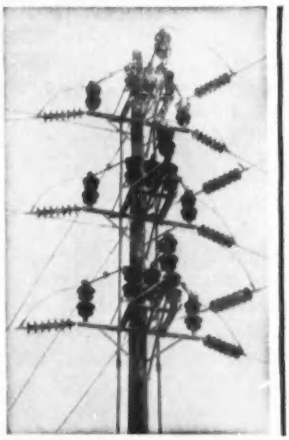
Many users of GOABS (Gang Operated Air Break Switches) report savings of at least 25% in installed costs compared to conventional type air break switches. Such savings are accomplished because GOABS mount on a single pole. This eliminates the need for multi-pole structures and reduces installation time to approximately one fourth of the time required for conventional installations.

Because of their vertical phase spacing and one-pole mounting, GOABS are convenient and economical to install at any tap point, particularly where multi-pole construction is undesirable or impossible; or where a tap is to be made from a vertically spaced circuit, as one circuit of a double circuit steel tower line.

You can get GOABS in 600 amperes, 15, 23, 34.5, 46, and 69 KV ratings.

Requires minimum right of way

Substation switching, loop interconnections or sectionalizing can be accomplished from a single switching point by the GOABS. With the GOABS you eliminate the need for costly extra real estate needed as right of way for conventional air break group operated switches mounted on H-frame structures. Investigate the GOABS today. They are convenient and economical to install at any tap point and are a real trouble-saver for installations where land costs or space limitations prohibit H-frame construction.



Saves valuable line crew time

GOABS are easy to install. Each complete phase of the switch is pulled up as a unit and bolted to the pole. No assembly is necessary on the pole. Mounting the switches on a single pole requires far less hardware and eliminates so many extra operations that expensive line crew time for installation is reduced to one fourth of that normally required for multi-pole structures. A GOABS installation is easy to maintain, too—the vertical phase separation provides 180° free climbing space for linemen.

Bulletin 601-A gives complete information. Write for your copy today.

CS54-10

ABC INDUSTRIES

A·B·CHANCE CO.

CENTRALIA, MISSOURI • SAN FRANCISCO, CALIFORNIA

Financing Hits Record In First Quarter

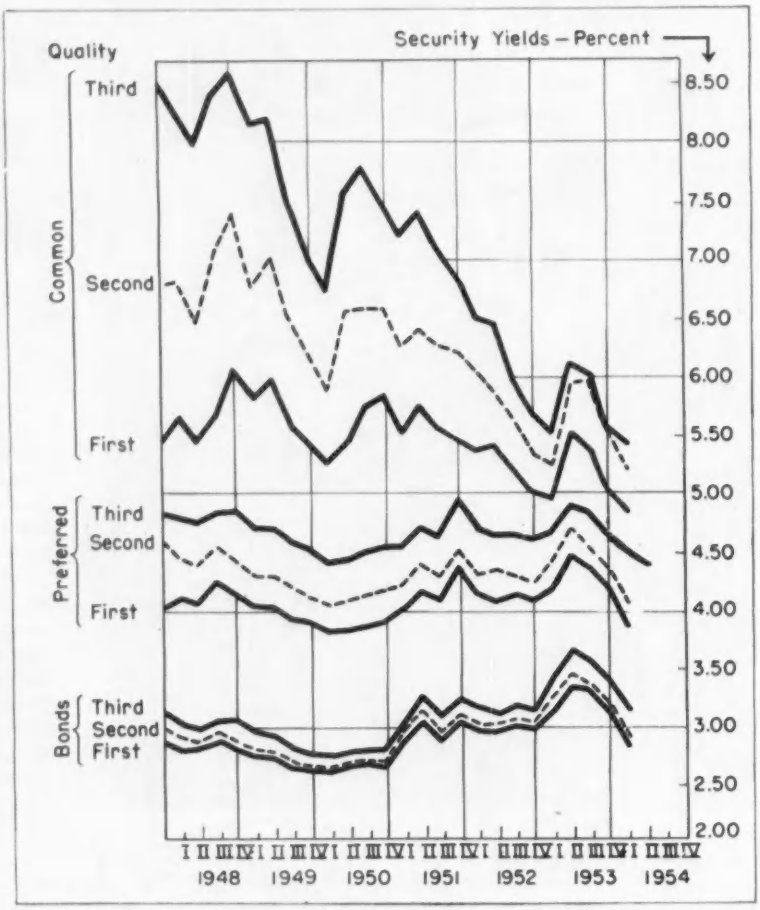
Utilities sell $625 million in securities to the public vs $439 million a year ago

A record total in electric utility financing was chalked up during the first quarter this year. Securities sold to the public aggregated $625 million compared with sales of $439 million in the corresponding quarter a year ago.

Private placements of bond and preferred stock issues ran close to $65 million, considerably below the corresponding figures of last year. The above totals exclude debt securities of Ohio Valley Electric Corp and Electric Energy, Inc, purchased by institutional investors.

Another Record Year . . . Present indications point to another record year in electric company financing. The 1954 construction budget is higher than last year's plant expenditures, although new money requirements may be no greater principally because the higher depreciation accruals provide additional cash. But the volume of bond and preferred refunding issues coming onto the market promises to establish an all-time record. High interest costs last year could not keep electric companies from obtaining funds required to provide the facilities needed to meet public demands. The opportunity to refund issues sold during that period of high money rates is at hand and many companies have announced refunding plans.

Debt securities offered to the public during the first quarter of 1954 totaled $453 million as compared with $202 million in the initial quarter last year. This year's figure includes $60 million raised by Commonwealth Edison Co in January through an offering of bonds secured by divisional lien on its gas properties. This company's gas properties were then transferred to a subsidiary organized for the purpose of taking over the Chicago utility's gas business. Money received from the bonds is available to Commonwealth for electric property additions.



SECURITY YIELDS all went down sharply in the first quarter of 1954 as compared with the fourth quarter of 1953. Smallest decrease was registered by third quality common stocks.

While many refunding plans were under way during the first quarter, Detroit Edison Co was the first electric company to carry out these plans. During the latter part of March this company offered competitively $40 million general and refunding mortgage bonds. The coupon was fixed at 2⅞% and the interest cost after underwriting expense was 2.94%. The proceeds will be used to redeem a like amount of 3⅞% bonds sold last year. The lowering of the interest rate means a saving to the company

Public Offerings—Electric Utility Securities
(Thousands of Dollars)

	First Quarter of 1954			First Quarter of 1953		
	New Money	Other	Total	New Money	Other	Total
Bonds, Notes, and Debentures	412,850	40,000	452,850	199,800	2,000	201,800
Preferred Stocks	46,630	.....	46,630	70,717	.....	70,717
Common Stocks	125,383	.....	125,383	166,092	.....	166,092
Total	**584,863**	**40,000**	**624,863**	**436,609**	**2,000**	**438,609**

over the life of the bonds of several million dollars.

It was in late April, 1953, when Detroit Edison Co opened bids on the bond issue now being refunded this year, that the seriousness of the money squeeze was first apparent. The best bid indicated that the money cost would be 3.81%, a full quarter of 1% higher than the cost of an issue of like quality sold only a fortnight before. At the time all money costs were rising rapidly. The average rate on the three-month bills which the Treasury sells each week had climbed to around 2.30%. The then new Treasury 3¼% thirty-year bonds were barely holding par.

When Detroit's refunding issue was sold last March, money rates had fallen considerably. The average rate on the three-month Treasury bills was but a little above 1% and 3¼% long term Treasury bonds were selling on a basis to yield 2.73% to the nearest call date.

Money Rates Down . . . During the first quarter of 1954 the continuous downward drift in all money rates is attributed primarily to a falling off in business loans. The Federal Reserve System's reductions in rediscount rates to 1¾% in February from 2% and again to 1½% in April have followed the price of money down, not led it. However, it does not point up the fact that the intention of the FRB is to keep money cheap until business recovers.

The lowering of money costs is also reflected in the rates electric companies paid for new preferred issues. The average yield at the public offering price this year was 4.20% as compared with 4.52% last year.

Although the Dow-Jones utility average continued to climb to new high levels during the first quarter of this year, the volume of common stock offerings was smaller than the amount a year ago.

Eleven electric companies announced increased common dividends in the first quarter of 1954 as compared with 14 increases in the first quarter of 1953. While financing plans for the second quarter of 1954 are not completely crystalized, it seems apparent that the volume of common stock sales will fall considerably below the $163 million offered in the second quarter of last year, which suggests a heavy volume later in the year.

Today in Utility Finance

YIELDS (%)

Quality	Bonds			Preferred Stocks			Common Stocks		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
DATE									
1954									
April 29	**2.85**	**2.93**	**3.16**	**4.02**	**4.14**	**4.47**	**4.78**	**5.14**	**5.44**
April 22	2.84	2.88	3.16	3.98	4.15	4.44	4.77	5.14	5.35
END OF QTR.									
1st 1954	2.82	2.87	3.14	3.88	4.09	4.42	4.83	5.19	5.42
4th 1953	3.07	3.12	3.34	4.17	4.32	4.62	5.07	5.57	5.51
3rd 1953	3.30	3.33	3.54	4.35	4.52	4.83	5.36	5.97	6.01
2nd 1953	3.34	3.46	3.64	4.47	4.70	4.88	5.52	5.93	6.10

Date: Reis & Chandler, Inc.

EARNINGS

Company	Period Months	Ended	Net Income 1954	Net Income 1953	Earnings Per Common Share 1954	Earnings Per Common Share 1953
Arkansas Power & Light	12	Mar.	$6,390,042	$5,683,260	$....	$....
Central Power & Light	12	Mar.	5,870,070	4,730,264	....	....
Consolidated Edison Co of N. Y.	12	Mar.	48,980,843	47,623,654	2.89(a)	2.81(a)
Florida Power & Light	12	Mar.	8,934,500	7,795,901	3.27	2.89
Mountain States Power	12	Feb.	1,930,200	1,663,438	1.40	1.18
Niagara Mohawk Power	12	Mar.	26,582,231	24,050,754	2.05(b)	1.96(b)
Public Service Co of New Mexico	12	Mar.	1,157,100	1,151,188	.73(c)	.83(c)
Public Service Co of Oklahoma	12	Mar.	5,634,326	5,110,547	....	....
Southern California Edison	12	Mar.	22,522,097	23,796,015	2.42(f)	2.89(f)
Southwestern Gas & Electric	12	Mar.	4,291,366	3,877,026	....	....
			1953	**1952**	**1953**	**1952**
Central Maine Power	12	Dec.	$4,554,210	$4,630,043	$1.45	$1.48
El Paso Electric	12	Dec.	1,680,680	1,554,388	2.11	1.95
Gulf Power	12	Dec.	2,155,135	1,795,230	....	....
New Orleans Public Service	12	Dec.	3,594,659	3,509,047	....	....

Notes—Figures shown for the last four companies have been audited; (a) Based on 13,655,603 shares in 1954 and 13,546,139 shares in 1953; (b) Based on 11,556,036 shares in 1954 and 10,806,036 shares in 1953; (c) Based on 1,386,437 shares in 1954 and 1,385,092 shares in 1953, and (f) Based on 6,954,427 shares in 1954 and 6,134,722 shares in 1953.

FINANCING

Company and Description	Amount of Offering (000)	Offering Price	Yield to Public
WEEK OF APRIL 29—MAY 5			
Bonds			
Delaware Power & Light—1st mtg 3⅛% due 1984	$10,000	102.461%	3.00%
Montana Power—1st mtg 3⅛% due 1984	6,000	102.66	2.99
Wisconsin Electric Power—1st mtg 3⅛% due 1984	20,000	102.461	3.00
Cleveland Electric Illuminating—1st mtg 3% due 1989	20,000	101.086	2.95
Preferred Stock			
Empire District Electric—40,000 sh 4¾% $100 par	$4,000	$100.00	4.75%
Montana Power—60,000 sh $4.20 no par	6,000	102.00	4.12
Niagara Mohawk Power—210,000 sh 4.10% $100 par	$21,000	100.00	4.10%(a)
Common Stock			
Housatonic Public Service—41,159 sh (being offered common-holders on 1-for-8 basis, record April 23, to expire May 13; unsubscribed shares to be offered to employees)	$864	$21.00	6.67%
Wisconsin Electric Power—421,492 sh (being offered common-holders on 1-for-10 basis record April 27 to expire May 20)	11,064	26.25	5.71
SCHEDULE FOR MAY—JUNE			
Bonds			**Bid Date**
Iowa Public Service—1st mtg due 1984	$7,500	.....	May 10
Consolidated Edison Co of N. Y.—1st mtg due 1984	50,000	.....	May 17
Virginia Electric & Power—1st mtg due 1984	25,000	.....	May 18
Pacific Gas & Electric—1st mtg due 1984	65,000	.....	May 19
New York State Electric & Gas—1st mtg due 1984	20,000	.....	May 25
California Electric Power—1st mtg due 1984	8,000	.....	May 26
Public Service Electric & Gas—1st mtg due 1984	50,000	.....	June 7
Consumers Power—1st mtg due 1984	25,000	.....	June 8
Southwestern Gas & Electric—1st mtg due 1984	10,000	.....	June 22
Gulf Power—1st mtg due 1984	10,000	.....	June 22
Duquesne Light—1st mtg due 1984	15,000*	.....	.....
Debentures			
Montana Power—debs due 1979	$18,000	.....	May 12
Preferred Stock			
Missouri Public Service—50,000 sh $100 par	5,000	.....	May 19(b)
California Electric Power—105,000 sh $50 par	5,250	.....	May 19(c)
Public Service Electric & Gas—249,942 sh $100 par	24,994	.....	May 19(f)
Duquesne Light	5,000*	.....	June 22
Common Stock			
General Public Utilities—606,423 sh (to be offered common-holders on a 1-for-15 basis, record May 12 to expire June 2)	.....	.....	.....
Philadelphia Electric—900,000 shs (to be offered common-holders on 1-for-12 basis, record June 7)	.....	.....	.....

Notes—* Estimated; (a) Being offered by Harriman, Ripley & Co, group, underwriters; (b) Kidder, Peabody & Co group, underwriters; (c) Merrill Lynch, Pierce, Fenner & Beane group, underwriters; and (f) Morgan Stanley & Co, Drexel & Co, and Glore, Forgan & Co group, underwriters.

Fair Value Is Employed . . .

. . . by Indiana Public Service Commission to determine $1,670,000 annual rate increase granted to Indianapolis Water Co

Indiana Public Service Commission has granted the Indianapolis Water Co an estimated annual rate increase of $1,670,000 based on fair value.

In the determination of the fair value rate base, the PSC gave consideration to original cost, both on a gross and net book basis, of $34.12 million and $30.93 million, respectively. It also gave consideration to original cost less estimated accrued depreciation of $28.19 million. As to Reproduction Cost New depreciated, three levels of prices were considered: Ten-year average price level of $45.53 million; five-year price level of $52.34; and, finally, a spot price level of $59.14 million.

Finds Fair Value . . . The commission, in finding fair value, said: "The ascertainment of fair value calls for the exercise by the commission of an informed judgment based upon all the evidence and arrived at in consonance with the statutory direction and the principles on this subject which have been laid down by our own Supreme Court. In the instant cause the commission has approached the ascertainment of fair value in the light of these principles; and the commission finds upon all the evidence that the present fair value of petitioner's used and useful property, including materials and suppliers, is not less than $36.5 million."

In the determination of working capital, the commission allowed only materials and supplies but no cash working capital.

Halts Allowance for Working Capital . . . The commission said: "Both federal income taxes and Indiana real and personal property taxes are payable at dates significantly later than the accounting period for which the liability is incurred. The cash reflected by these charges against revenue on account of the tax liability serve to augment the cash position of the company and is available working capital until the funds are required to meet the tax obligation. The commission, therefore, finds that no further allowance for working capital will be added to the rate base in this cause."

It is significant PSC mentioned both federal and local taxes in making this adjustment. In the past PSC's have generally used only federal taxes.

As to the reasonable return, the commission found that the proposed schedule of rates would yield $2,070,000, or a return of 5.67% on the fair value rate base mentioned previously.

Depreciation Accruals . . . With depreciation accruals, the commission stated that "the evidence shows that for many years the petitioner herein has been allowed an annual accrual to its reserve for the depreciation of its depreciable property at a composite rate of one (1%) per cent; that the petitioner from actual experience for more than thirty-seven (37) years with respect to its utility plant, other than transportation and mechanical equipment, and for almost twenty (20) years with respect to that classification of property, demonstrates that this rate of accrual has been inadequate; that the petitioner seeks to increase its rate of depreciation and suggests the figure of one and six-tenths per cent (1.6%); . . ."

The commission, however, found that 1.45% to be reasonable and ordered it to be put into effect.

As to the petition of the City of Indianapolis to have separate and higher rates for areas outside of cities and towns, the PSC said, "The evidence shows that the petitioner herein has shown by the several exhibits admitted in evidence that its utility plant operates as an integrated system; that the commission is of the opinion that the Indiana statute (Burns Statutes, Section 54-201) contemplates the fixing of a uniform schedule for the entire area served by the petitioner in the absence of specific proofs showing different operating costs for different areas; that the record before this commission does not disclose evidence introduced by intervenor or any other party establishing such differences in costs as would warrant the differences in rates which the City of Indianapolis, the intervenor herein urges."

Reproduction Cost Key Factor

Superior Court of Delaware has ruled in the Diamond State Telephone Co rate case that Delaware statute requires the Delaware Public Service Commission to find a fair return on the fair value of the property and that this fair value is the present fair value. This finding was made by Justice Caleb R. Layton.

The court held predominant weight should be accorded reproduction cost and only minor weight to original cost. Consequently, the court said, the commission erred in only according a value of 12% above original cost. Such nominal weight did not meet the requirement of the statute.

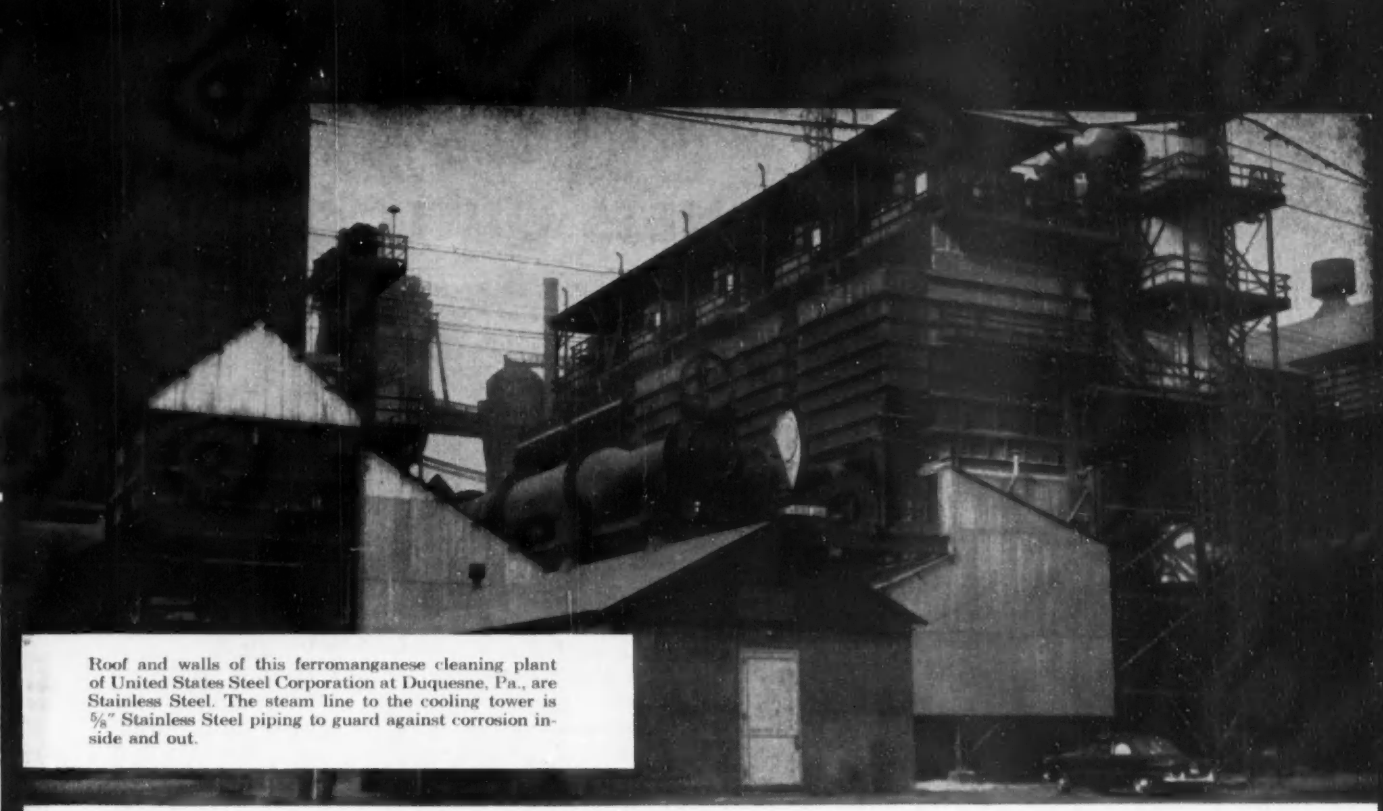
The justice went on to say ". . . I conclude that the adoption of a rate base of 90% of the company's reconstruction cost study (April 30, 1953) or, in round figures, $25.5 million should reasonably approximate the fair, present value of the company's intrastate property."

With regard to working capital, the court found that the commission was not justified in interfering with the sound judgment of the board of directors in providing amounts for cash working capital.

The court found that the commission was in error in excluding from operating expenses both charitable contributions and the full effects of wage increases, granted during the test period.

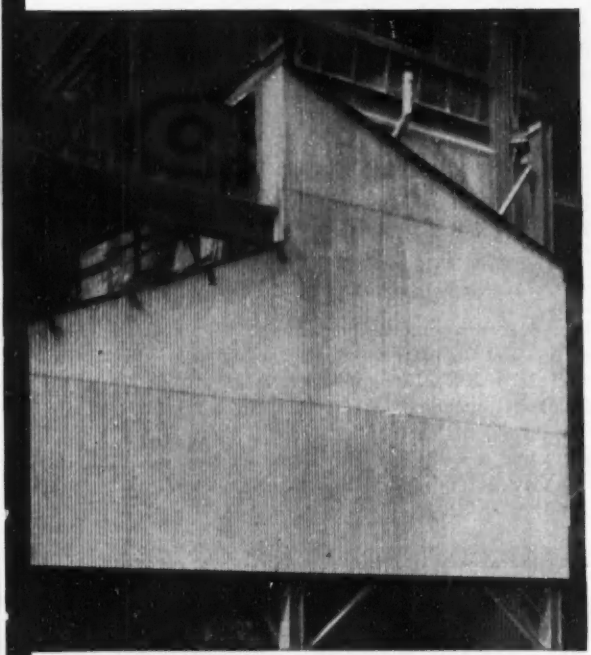
The court also decided that the commission was in error in assuming a hypothetical debt ratio in calculating the tax liability of the company.

It found that a return of 6¼% was fair and reasonable on the above rate base.



Roof and walls of this ferromanganese cleaning plant of United States Steel Corporation at Duquesne, Pa., are Stainless Steel. The steam line to the cooling tower is 5/8" Stainless Steel piping to guard against corrosion inside and out.

Built for *maximum* resistance to gases, dirt and moisture with STAINLESS STEEL roof and walls



A closer view of the wall of the plant shows how the 24-gage corrugated Stainless Steel siding is applied.

By the very nature of its purpose, this building is going to take a beating. It houses a battery of electrostatic precipitators to clean gas from ferromanganese blast furnaces at Duquesne Works of United States Steel Corporation.

Ferromanganese cleaning involves much corrosive dust and fumes, in addition to the moisture and dirt generally found in industrial atmospheres. To give the building maximum life, it was constructed with a roof and walls of U·S·S Stainless Steel.

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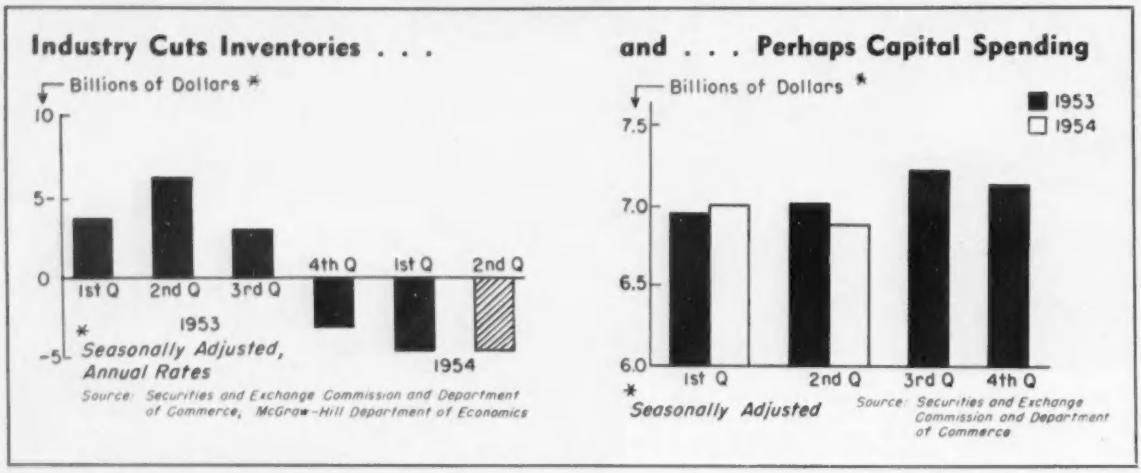
UNITED STATES STEEL

ELECTRICAL BUSINESS OUTLOOK



Changes in inventory policy factor in . . .

Present Business Activity Decline

The businessman's part in the current slow business decline is beginning to show a clearer pattern. Like the consumer (EBO, April 12), the businessman seems to be following a reasonable middle-of-the-road path in making policy decisions this year.

Changes in business inventory policy were one of the main causes of the present decline in business activity. Industry started increasing its stocks rapidly after 1952 steel strike.

Inventories Over-Built . . . Inventories turned out to be over-built sometime in the middle of 1953. So, industry started to cut its stocks, as expected (EBO, April 27, 1953). A decline in defense spending, starting about the same time, helped accelerate the cuts in inventories.

This big change in inventory policy—from a big plus to a fairly sizable minus—accounts for most of the 10% drop in industrial production since the peak last July. Declines in production have been heaviest in industries that make durable goods.

All in all, it seems that inventories will have to be cut a good deal more before they get back to a more comfortable relation to sales. It is estimated that total business inventories were about $4 billion too large when the current decline started. Since then they have been cut by well over $1 billion. But sales have also declined. It seems that inventories ought to be dropped by another $3 billion or so, unless some new influence—such as a new war scare—appears on the business scene.

New Plant and Equipment Spending Important . . . Inventories, however, represent only one part of the direct business contribution to current economic activity. Business' spending for new plants and equipment is also highly important. And all indications are that businessmen are following the same sort of investment policy that they are applying to inventories. That is, they are cutting spending a little. But they are not cutting sharply. And that's very good news for the economy as a whole.

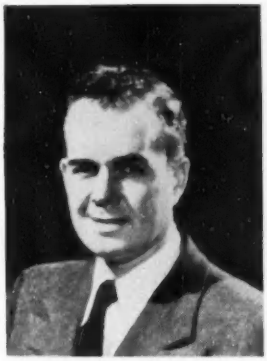
Recent surveys by the McGraw-Hill Department of Economics and the United States Department of Commerce both tell a similar story, although some of their statistics differ a little. They both report that industry plans to spend a bit less for new plants and equipment than it did last year. But the cuts industry plans to make are relatively small.

It is a striking fact that industry plans to cut its capital spending only 2%-4% this year—in the face of declining sales. In the past, sales declines would have meant really big cuts in capital spending. This year, the cut is expected to be small, at least under present plans. And manufacturers told the McGraw-Hill Department of Economics that they did not plan to cut their investment spending at all.

This has been the pattern of business policy in the recession—reasonable, but not drastic, cuts in inventories and capital spending. If the same policy holds in the near future, then two things are clear—barring a new war or new defense policy in Washington:

1. The decline in business activity will continue for some months—perhaps through the year. And, if there is a recovery this year, it will probably be a fairly slow one.

2. But—and it's a key "but"—the recession will be slow and minor, rather than sharp and drastic. In the past, industry has made recessions worse by running for cover when trouble comes, sharply cutting inventories and new investments. There's no sign of that this year.



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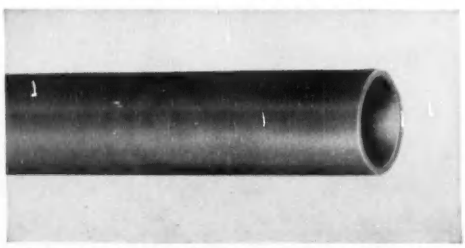

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